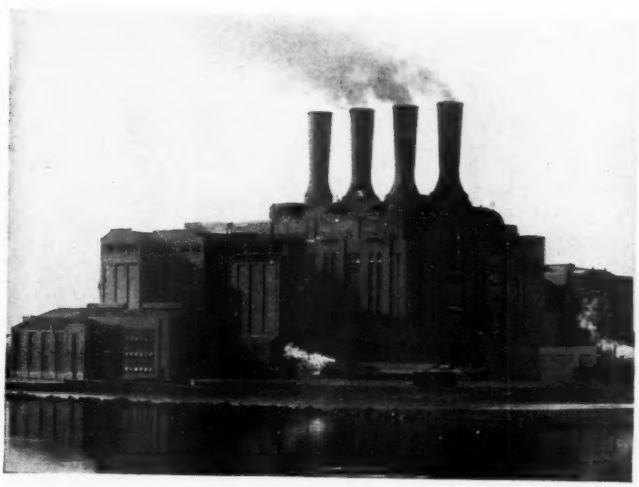
EDISON ELECTRIC INSTITUTE BULLETIN



VOLUME I JUNE 1933 NUMBER 3

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 1 JUNE, 1933 Number 3

INSTITUTE'S FIRST CONVENTION A NOTABLE SUCCESS

The First Annual Convention of the Edison Electric Institute was held at the Palmer House, Chicago, from Monday, June 5, through Thursday, June 8, with a total registration of twelve hundred delegates and guests who, despite a period of unusual heat and the counter-attractions of Chicago and the Century of Progress Exposition, kept the Grand Ballroom of the hotel completely filled during each of the business sessions. The Convention was modest by comparison with some of the big electrical gatherings of the past and it lacked many of the frills that ordinarily accompany a national convention, yet it was the freely expressed opinion of many veterans of the industry that it was the most satisfactory convention they had ever attended. The genuine enthusiasm exhibited by everyone there and the high percentage of senior executive officers present, with their obvious determination to make the Institute a thoroughly effective organization, were important contributions to its success, as well as notably good omens for the future of the Institute.

Only four general sessions were held and these were, as was well expressed by Mr. Thomas N. McCarter, "real get together talks of the industry, where the engineer, the new business man and the executive all met together, rather than in separate meetings with each ignorant of the problems of the other." The programs for these sessions centered chiefly on engineering and commercial problems, rates, taxation and legislation. A valuable part of the program was the discussion, both prepared and informal, that followed a number of the papers. Several of the papers and addresses are printed in this issue of the *Bulletin*, and the remainder will appear in later numbers.

On Wednesday afternoon, June 7, the Convention turned out en masse at the Century of Progress Exposition to take part in the exercises dedicating the Electrical Building. President Cortelyou, Mr. Rufus C. Dawes, President of the Exposition, Mayor Kelly and Mr. D'Arcy Ryan all spoke on this occasion, their addresses being broadcast over a N.B.C. network, and Mr. E. W. Lloyd acted as Master of Ceremonies.

Much credit for the success both of the convention and of the electric light and power industry exhibit at the Exposition is due to Mr. Lloyd and his associates, and official recognition of this fact was embodied in resolutions passed on the closing day of the convention. The accommodations and courteous service provided by the Palmer House staff also contributed in no small measure to the enjoyableness of the gathering.

A meeting of the Operating Committee, and organization meetings of most of the technical committees of the Institute were held during the period of the Convention. These meetings are briefly reported elsewhere in this issue.

The first session of the Convention began promptly at 10 a.m. Monday, June 5. Noting that the Convention was the beginning of a new cycle "which we hope will mark still greater advances in efficiency and standards of conduct and performance of the electric light and power industry than have been achieved hitherto" President Cortelyou in the opening address told of the aims of the new Institute and the work it has accomplished since its formation. The latter part of his address was devoted to comments on the tax burden imposed on the electrical industry and the relationship between taxes and possible rate reductions.

Mr. B. F. Weadock summarized a report from the Treasurer which showed that the Institute is operating well within the budget arranged for the first year. In his report as Managing Director of the Institute, Mr. Weadock said in part: "We are now, and have been for some time, fully and completely functioning as a trade association for the industry. We have an efficient staff. . . We are operating without any publicity. We are confining ourselves strictly to the handling of factual and technical information, and we are prepared to give all information of that character that any member company may desire. And on any problem regarding which you desire statistics or facts which you believe might be helpful, we are qualified to have them at your command upon a reasonable notice. Our committee reports will, I believe, be exceptionally valuable. . . Mr. Cortelyou, and Mr. Cobb, the Chairman of the Board of Trustees, have devoted their time practically without limit to seeing that we are organized, established and operating. And I believe that the Institute owes those two gentlemen a vote of thanks for their unselfish devotion to the cause."

Mr. Alex Dow's talk, and the paper on Distribution Costs by Mr. Norman R. Gibson together with its discussion by Messrs. Fuller, Gear and Blake appear in this issue.

Mr. E. W. Lloyd officially welcomed the delegates to Chicago and then described the electric light and power industry's exhibition "Electricity at Work" at the Exposition and gave an entertaining outline of what the Exposition held in store for the visitor.

At the second session, held on Tuesday morning, Mr. S. M. Dean, The Detroit Edison Company, presented a paper on "Outages, Service Standards and Investment" which showed how a thorough study and careful appraisal of service interruptions may be of value in forming a basis for the control of investment in electrical supply systems, when combined with investment analyses and carefully considered service stand-

ards. Mr. Dean's paper, together with its discussion by Messrs. H. W. Eales, B. L. Huff, A. E. Silver and Merrill W. DeMerit will be published in the July issue of the BULLETIN.

Mr. B. C. Cobb, Chairman of the Board of Trustees was called upon for a talk. He mentioned his connection with a holding company, and said that while he held no brief for holding companies, nor for operating companies, he thought there should be a happy combination of the two, plus a happy combination of centralization and decentralization. "Working together in that way," he said, "we can get results, better, in my opinion, than in any other way."

Mr. Cobb spoke of his work as Chairman of the Board of Trustees and made acknowledgement of the assistance he had received in his work for the Institute. He complimented Mr. Cortelyou, Mr. Weadock and the Operating Committee on the success of the Convention. He concluded by saying, "The past two years have caused all of us, in and out of the industry a lot of trouble. We aren't through yet. We have many hurdles to jump. But we must not get discouraged, because in the end we are going to pull out. I still have faith in this great industry, which in my opinion has done more for the advancement of mankind and civilization than any other industry in this country and in the world at large.

"We have been under attack, and still are. In many instances unjustly and purely for political purposes. I may also add—there is no use in denying it—that some of us have made mistakes, and those mistakes must be corrected. . . . In my opinion we should defend ourselves valiantly when we are right, and we should acknowledge with good grace when we are wrong or when we have committed error."

Mr. F. S. Clark, Consulting Engineer of the Stone & Webster Engineering Corporation, presented a paper on developments and trends in power stations. Mr. Clark's paper was discussed by Messrs. W. S. Monroe, E. W. Allen, A. R. Smith, P. W. Thompson and Dr. S. M. Kintner. Both the paper and the discussions will appear in an early issue.

An evaluation of our National Coordinated Promotional Programs by Mr. J. E. Davidson, and a discussion of the National Electric Cookery Council Program by Mr. P. S. Arkwright, both of which are printed in this issue, concluded the second session.

The possibilities in the development of air conditioning was the subject of a paper by Mr. E. C. Michel, Sales Manager of the Union Electric Light & Power Co., St. Louis, Mo., at the third session of the Convention. Mr. Michel sketched the applications of air conditioning in industrial processes, and its introduction into theaters, restaurants, stores and other indoor areas where the workers share in the comfort given the public that patronizes such establishments. As the health and comfort value of clean, pure air is more widely understood, air conditioning service will be adopted in the home, Mr. Michel asserted. He pointed out that there were already many installations in the homes of St. Louis and in other cities of the country, and it is his conviction that an acceptance of room-cooling will be built up just as the market for electric refrigeration has been developed.

The discussion of Mr. Michel's paper was in three aspects, air conditioning in industrial, commercial and residential applications, by Messrs. R. H. Tillman, Consolidated Gas, Electric Light & Power Company, and Davis M. DeBard, Stone & Webster Service Corporation, and on the general points of the development by Mr. W. H. Hodge, Byllesby Engineering & Management Corporation.

A revival of interest in electric lighting as a source of profit to the utilities was foreshadowed in the next group of papers. The first was "Lighting Fields to Explore with Profit," by Mr. M. E. Skinner, Niagara Hudson Power Corporation, which was followed by discussions by Mr. H. M. Sawyer, American Gas & Electric Company, on commercial and industrial applications, by Mr. R. E. Fisher, Pacific Gas & Electric Company, on residence and rural applications, and by Mr. Oliver Hogue, Commonwealth Edison Company, on the general subject of lighting. Mr. Skinner's paper dealt principally with the possibilities of improving lighting conditions by showing customers how best to use electric light. In evidence of his contention that most people, even in this day, have little conception of the proper use of light, Mr. Skinner presented the results of a recently completed investigation in Utica, N. Y. This investigation was short and covered only about 85 customers, and was intended only to sample the existing conditions. But the investigation proved, said Mr. Skinner, that customers would respond to such efforts in two ways, improved revenue and in better feeling toward the service company.

Amusing as well as instructive interludes were provided during this session by two dramatic skits, the first being a visual demonstration of lighting sales methods and the second one based around the idea that Conventions Pay.

This session closed with a summing up of the selling job now before the electric utilities, given by Mr. George E. Whitwell. Mr. Whitwell's paper is printed in this issue.

An address on "Taxation," by Mr. W. C. Mullendore, one on the "Trend of Rates," by Mr. F. A. Newton, and a discussion of "Some Phases of the Federal Trade Investigation," by Mr. Bernard F. Weadock, all of which appear in this issue, were the main features of the fourth and last session, held Thursday morning, June 8. At this session certain amendments to the Constitution, noted elsewhere in this issue, were voted on and passed and an announcement regarding the prize awards to be sponsored by the Institute was read by Mr. A. H. Kehoe for Mr. Frank W. Smith, Chairman of the Prize Awards Committee.

Brief talks were made by Messrs. Samuel Ferguson, George N. Tidd and Thomas N. McCarter. Mr. Tidd remarked that he had never attended a convention from which he had received as much benefit as he had from the present. Mr. Ferguson and Mr. McCarter also commented on the excellence of the Convention.

OPERATING COMMITTEE MEETING

Approval of the programs and organization of the Accounting, the three engineering committees, the Rate Research, Sales and Statistical Committees was given by the Operating Committee at a meeting held the afternoon of June 6 at the Palmer House, Chicago. The chairmen of the technical committees were present at the meeting and the Operating Committee carefully went over with each chairman the detailed committee plans.

Other matters dealt with by the Operating Committee included consideration of recommended amendments to the constitution, approval of the plan of the Sales Committee for a Lighting Sales Campaign to be held this coming fall and an appropriation of $1,500 in connection with the promotion of the campaign.

The Operating Committee approved a

(Continued on page 73)

THE PRESIDENT'S ADDRESS

BY GEORGE B. CORTELYOU
President, Edison Electric Institute

Address before the First Session of the First Annual Convention of the Edison Electric Institute, Palmer House, Chicago, Illinois, June 5-8, 1933

Unusual interest attaches to beginnings. This first annual convention of the Edison Electric Institute is both a beginning and a continuation. It is the beginning of a new organization, with a new constitution, a new code and a new outlook, and at the same time it is a continuation of the essential work of the predecessor organization, the National Electric Light Association. It is an interesting coincidence that the first meeting of the National Electric Light Association was held in this city in 1885; and now nearly a half-century later in the same city we begin a new cycle which we hope will mark still greater advances in efficiency and standards of conduct and performance of the electric light and power industry than have been achieved hitherto.

We are fortunate that this first general meeting should be held during Chicago's second great exposition. The World's Columbian Exposition held here 40 years ago, in 1893, played an important role in advancing the electrical art by bringing to the attention of the world at that time the great promise of electrical development. Unquestionably, the electrical exhibits at the present exposition will likewise render a notable contribution by depicting in a clear and striking manner the early as well as the most recent steps in this long course of progress.

A simple program has been arranged for this convention, designed to stimulate discussion concerning matters of current importance to the industry. The great value of direct debate upon the problems of the industry has been demonstrated many times and no other means has been found to take its place. It may be a rather difficult task to achieve the ideal of ample and fruitful discussion in the midst of a large metropolitan city and concurrently with the progress of a great exposition, but, of course, the opportunities afforded by this great fair outweighed other considerations.

This general meeting and convention typifies a return to simpler organization and less formal proceedings. One of the principal considerations which led to the organization on Jan. 12, 1933, of the Edison Electric Institute and the dissolution on Feb. 15 of the National Electric Light Association was the feeling which was quite generally held of a necessity to effect a radical simplification in the size and character of the trade association of the electric light and power industry and to make a corresponding curtailment in its cost. Over a period of time there had been built up a ramified committee structure and a multiplicity of functions which had come to constitute a heavy demand in time and money on the member companies.

A second important factor in the decision to organize a new trade association in the industry was the need which had been felt for a number of years for an organization that had the power to exercise some degree of discipline over its members with respect to their business practices. The events of the past few years brought this need particularly to the fore, and the Constitution of the Edison Electric Institute, to which all members must subscribe, places in the hands of the membership committee and the board of trustees the needed authority to permit this control. It provides that the business practices of any company member may be investigated and such member may be expelled or otherwise disciplined for violation of proper or ethical practices or for failure to furnish information as called for under the provisions of the Constitution. The important business principles to which company members must agree to bind themselves provide for the publication of financial statements setting forth specified information. They require the certification of these statements by independent firms of certified public accountants after audit of the books of the companies. They require that all statements and data furnished to consumers, stock exchanges, stockholders, all information designed for public dissemination, and all reports to governmental authorities shall be vouched for as to their accuracy and shall clearly indicate their source. Another requirement is that all contracts between member companies involving the furnishing of management, supervisory, construction or financing services to operating electric utility companies shall be so drawn and so carried out in practice that the charges to the operating company shall be reasonable and commensurate with the value of the services rendered and the fair cost thereof to the company furnishing the services.

Every effort has been made by the organizers of the Edison Electric Institute to build simply but at the same time to provide an adequate foundation for a structure that will meet not only the immediate needs of the industry's trade association but will provide scope for such further endeavors as from time to time may be found of advantage and profit to the member companies.

The objects of the Edison Electric Institute as set forth in its Constitution are as follows:

1. The advancement in the public service of the art of producing, transmitting and distributing electricity and the promotion of scientific research in such field.
2. The ascertainment and making available to the members and the public of factual information, data and statistics relating to the electric industry.
3. To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor and employee.

Perhaps the most fruitful function an industry organization can perform is to provide a medium for the interchange of information and experience data. This is the basic reason for associating and is the primary purpose of all papers and nearly all committee and other meetings. The advantages to be gained generally increase in proportion to the number of individuals engaged and the ideal situation would be for all ranks in the industry to have opportunity to meet with those in like positions and in similar lines of work. While this is not feasible under the existing circumstances, I feel that it should be an important duty of the committees of the Institute to

make the best provision possible for the dissemination and exchange of information, particularly among the younger men throughout the industry, who are actively engaged in specific problems connected with the production and sale of electricity.

Next to the function of providing a means for the interchange of information and experience, perhaps the most important function of our trade organization is what might be termed "internal legislation," such as the formulation of engineering standards, specifications, technical procedures, operating programs and other instrumentalities making for the wide adoption of the best practices and promoting uniformity where uniformity is advantageous. Since the member companies are not in competition one with another, this cannot give rise to abuses or go counter to the public interest, and it furnishes a wide field for profitable activity in the Institute. The electrical industry during the past 50 years has been a leader in the field of profitable standardization and in no small degree the present wide availability of comparatively cheap electric power and the great convenience and saving to the public afforded by standardized electric service are the result of an enormous effort in man-hours devoted to the development of standardization and uniformity in electrical equipment and in operating practices.

Another important field in which the trade association can render valuable service to its members is as the representative of their interests in relations with other national industrial bodies and organizations. Many industries are organized on a national scope and, as a practical matter, dealings with such bodies can best be handled through the trade association because of the handicaps which confront individual companies in attempting on their own account to deal directly with them. These joint relations in some instances may involve engaging in specific cooperative enterprises, but more often they have to do with the coordination of respective interests or practices to promote mutual well-being and to minimize any conflicts or interference which the operations of one industry may occasion with respect to those of another. These relations with other national organizations are particularly important in the engineering and commercial fields. In the commercial field they occur in connection with marketing problems, in competitive power problems and in such technical fields as illumination. In the engineering field they occur in connection with standardization, in new developments where constant contact with manufacturers is important, in dealings with public and insurance codes for electrical construction, in the coordination of the services and plants of other utilities, and to some extent in research work requiring cooperative effort.

My reason for dealing at some length with this matter of relations with other organizations is the fact that the electric light and power industry is now enjoying great benefits as a result of the efforts put forth during the past 10 or 15 years by the National Electric Light Association toward working out joint problems with other industries on a cooperative basis and because the current events at present would appear to make this field even more important to the industry than it has been in the past.

All of the foregoing considerations with respect to the field of usefulness of the Edison Electric Institute for service to its members were carefully studied and evaluated by the Board of Trustees and the officers in outlining a committee structure for the Institute, in determining the size and character of a staff organization and in setting a budget and fixing membership dues.

The organization of the Institute was effected on Jan. 12 of this year at a meeting in New York sponsored by a number of the leaders of the industry and attended by many of the principal executives. A constitution was adopted and officers and trustees were named. At a meeting of the Board of Trustees on Feb. 16, an operating committee was appointed with charge over the general activities and business of the Institute. At this same meeting was appointed the membership committee, to have jurisdiction and authority to consider applications for membership and to exercise disciplinary control over member companies for violation of proper ethical business practices or for failure to furnish information as properly requested. The personnel of these two committees, as well as the personnel of the board of trustees, have been published in the EDISON ELECTRIC INSTITUTE BULLETIN.

The membership committee has been active in the performance of its duties, and the Edison Electric Institute now has a membership, on the basis of production of electric energy, of 75 per cent of the electric light and power companies in the United States. Companies which have not yet applied but which have expressed an intention to do so should increase this to 80 per cent. Other companies have deferred making application until they learned what would be the annual dues and what activities would be undertaken to make membership worth while. It will be appreciated that under present conditions items of expense for dues, however small, are subject to the closest scrutiny and the cost weighed against value to be gained. It is the expectation of the officers of the Institute that as the work now being carried on becomes more generally known more companies will feel warranted in applying for membership.

The operating committee held its first meeting on March 1 and determined what technical committees should be organized and selected chairmen therefor. It decided what staff functions should be performed, determined in a general way what joint relations with other associations would be entered into, set up a budget to provide for the activities decided upon and fixed annual dues estimated to provide sufficient revenue for these purposes. Effective as of the date of the first meeting of the operating committee, the expenses of carrying out the functions so determined were assumed by the Edison Electric Institute. Appointments were extended to the committee chairmen selected and these in turn were asked to recommend personnel for their respective committees.

In view of present conditions, the number of committees was limited to nine and the committee chairmen were instructed to limit the sizes of their committees to the lowest practicable number consistent with the needs of the industry. The committees decided upon are as follows:

Prize Awards—Chairman, Frank W. Smith, The New York Edison Company.

Insurance—Chairman, to be selected.

Rate Research—Chairman, F. A. Newton, The Commonwealth & Southern Corp.

Statistical—Chairman, W. J. Hagenah, Standard Gas & Electric Company.

Accounting—Chairman, J. H. Lobban, The Detroit Edison Company.

Power Generation — Chairman, A. D. Bailey, Commonwealth Edison Company.

Transmission and Distribution—Chairman, Mark Eldredge, Memphis Power & Light Company.

Electrical Equipment — Chairman, J. A. Johnson, Buffalo, Niagara & Eastern Power Corp.

Sales—Chairman, George E. Whitwell, Philadelphia Electric Company.

Codes and Standards Subcommittee — Chairman, A. H. Kehoe, The New York Edison Company.

The size of these committees varies

from 3 to 26 members, and the total personnel of technical committees as contemplated in the organization now provided is 130. In thus limiting their size, the membership of the committees has necessarily been drawn largely from the higher ranks within the companies. In the case of some committees, notably the sales committee, it will be necessary to organize small subcommittees drawing in some of the men especially qualified in particular fields in order that the members through these committees may be apprised at reasonably frequent intervals of developments in the many ramified divisions of work in the industry. The technical committees will report from time to time their programs for work and the operating committee will give such plans its careful scrutiny to the end that the work undertaken may be most valuable to the industry, and at the same time that the expense of committee work be kept at a minimum.

Most of the technical committees have already held, or will hold this afternoon, meetings for organization, and their programs of activities as drafted at these meetings will be submitted for the approval of the operating committee at a meeting to be held tomorrow afternoon. Thus it will be seen that the committees are actively preparing to keep in touch with the important industry problems and to carry forward the more important work requiring committee action. The members of the committees which have now been organized will carry their appointments until June 30 of next year.

Another question to which the operating committee gave careful attention was that of joint committees and joint relations with other national organizations. The following are the more important cooperative undertakings of a specific character in which the Edison Electric Institute is participating by virtue of the decisions of the operating committee in this regard, as approved by the Board of Trustees:

The Edison Electric Institute is participating in the work of the American Standards Association and its many sectional committees dealing with matters of concern to the electric light and power industry.

It has a number of joint committees with the National Electrical Manufacturers Association dealing with specific questions of mutual concern.

It is a member of the National Fire Protection Association and contributes to the cost of maintaining a field engineer to promote a general adherence to the National Electrical Code.

It cooperates with the National Board of Fire Underwriters and has a joint agreement relating to the trial installation of electrical equipment and materials or of wiring methods not as yet recognized as safe practice by the National Electrical Code.

It is carrying on cooperative work with the American Railway Association, the Bell Telephone System and with the Western Union Telegraph Company in the matter of inductive coordination and other physical relations of the respective services and plants of these utilities.

It is participating in the electrical merchandising joint committee, with the National Retail Dry Goods, National Retail Furniture and the National Retail Hardware Associations.

It is participating in the work of the committee on the relations of electricity to agriculture and in the work of the National Industrial Conference Board, the Chamber of Commerce of the United States and, in a general way, is cooperating with other trade organizations.

The work of the Electric Refrigeration Bureau, which is now in its third year, is a cooperative marketing endeavor which has been an outstanding example of successful cooperative sales effort. Mr. Davidson, who has been the head of this Bureau throughout its existence, will report at the session tomorrow morning on the noteworthy progress of this program.

The National Electric Cookery Council, now starting its second year, is another important example of cooperative sales effort and has made good progress during its short existence. Mr. Arkwright will report to the Convention tomorrow morning on the work accomplished by this organization sponsored jointly by the Edison Electric Institute and the National Electrical Manufacturers Association.

It will be seen from the foregoing that this field of joint endeavor covers a wide and varied area and that it calls for the time and effort of many people within our industry. Fortunately, the representatives of the electric light and power industry on these various joint committees, together with the staff of the Edison Electric Institute, have had an extensive experience in this field which will serve to indicate in what directions joint efforts may be expected to yield a profitable return, what are some of the limitations of this kind of work, where the obstacles lie, and how to get the best results from a minimum of effort.

Another question settled by the operating committee was what publications should be issued by the Edison Electric Institute. It was decided to publish a monthly Edison Electric Institute Bulletin and to publish regularly certain statistical information. It was also decided to make available from time to time for the benefit of members such committee reports as were deemed to be of sufficiently general interest. In this connection, the committee reports of the National Electric Light Association gained and held a worldwide reputation as valuable sources of authoritative information on the production, sale and use of electricity.

The operating committee also gave careful attention to the question of staff organization, and a comparatively small staff is now employed, selected for its ability to deal with the questions particularly engaging the attention of the Institute at the present time.

In thus determining the general scope of work and the lines along which effort would be directed, I am sure that the operating committee and the Board of Trustees have acted wisely and that a maximum of return will be obtained from the expenses incurred. The budget has been kept down. It is but 46 per cent of the 1932 budget of the National Electric Light Association, exclusive of the budget allotments of its geographic divisions. For the first three months of its active operations, as the report of the treasurer will show, the Edison Electric Institute has been living safely within its income.

The matter of individual memberships in the Edison Electric Institute has received much consideration. In my opinion it is most important that the men and women down the line within the industry shall have a lively interest in its affairs. The constitution at present provides for individual memberships. It was planned at first to limit the number of individual members to a total of 2000, to be allotted among the company members on the basis of dues paid. This provision, however, will be further considered by the operating committee and the board of trustees, and may be made an item for action of this convention at the final session on Thursday morning, with the view to a more representative selection of participants in the activities of the Institute.

Since the organization of the Edison

Electric Institute, the question has been frequently asked as to what relationship exists between the Institute and the several State and territorial associations of electric light and power companies or of public utilities. It seems desirable therefore to state that no relationship with such organizations has been established, but the Institute is glad to furnish to such organizations any information which it may have regarding the industry; and in view of the similarity of the aims and purposes of the Institute and of these associations, the work and publications of the Institute will naturally be of interest to them. Their work will likewise be of direct interest to the Institute and therefore it is to be expected that an interchange of information will be carried on between the Institute on the one hand and the local organizations on the other.

The electric light and power companies in Canada, through the Canadian Electrical Association, have expressed a desire to work out some basis for membership whereby they could benefit from the proceedings of the Institute, particularly from the work of the engineering and sales committees. I feel very strongly that there is mutual advantage to be gained from such affiliation and I believe that some basis can be worked out which will be satisfactory to all concerned. A committee has been appointed for the purpose of looking into the question of constitutional changes which may be advisable to provide for membership of foreign electric light and power companies.

Now a word further about the program for this convention: There will be but four morning sessions, with no entertainment program of any kind, leaving the afternoons and evenings free for the delegates to visit the exposition, except that on Wednesday afternoon at 3.30 there will be held brief exercises on the promenade of the Electrical Building on the fair grounds. The convention committee and the officers felt that because of the exposition it would be unfair to the delegates to ask them to attend any general social gatherings.

The speakers on our program have been chosen from among the men in our own industry. They will address themselves to problems of current interest and concern in the management and operation of electric light and power companies. In general the papers will be open for discussion so that not only the ideas of the speaker may be brought before the meeting, but the viewpoints of other well informed men may be brought forward at the same time. There will be certain prepared discussions and, within the limits of time, it is hoped that there will be discussion from the floor so that our getting together may be made as profitable as possible.

Having thus summarized the events leading up to the formation of the Institute and the principal developments to date, I turn to a brief consideration of certain matters of more general interest to the industry at large and to its customers, the public.

During the 33 years that have elapsed since the turn of the century there has been no general increase in domestic electric rates in this country, save in the years 1918-20, when there were slight advances due to increased costs of labor, fuel and other materials during and following the World War. With these exceptions, every major change has been downward. Domestic electric rates now stand at 35 per cent *below* the pre-war level, while the cost of living is still about 32 per cent *above* the pre-war level. The average family pays seven cents a day for its electric service. In what direction will seven cents go further or buy more even in these days of low prices? Certainly there is nothing in these facts upon which to indict an industry or base a charge of excessive rates. On the contrary, I submit that an industry which, in the face of conditions that sent prices of nearly everything else shooting skyward, was able to keep its own prices pointing consistently downward has given a striking demonstration of efficiency and economy.

We are told that rates have not come down in proportion to the fall in commodity prices since 1929. The reply to that is, they have not come down because they never went up. What does not go up cannot come down. Rates which are limited to yield only a small fixed return in good times obviously allow no great margin for reduction in bad times, if the industry is to remain solvent. Yet domestic rates have shown a steady decline since 1929. Naturally they have not declined in the same degree as some commodity prices—not having had the same lofty eminence from which to descend—but there have been numerous reductions, many of them substantial, amounting in the aggregate to 11 per cent, or from 6.3 cents to 5.6 cents per kilowatthour on the average for the country as a whole; and such reductions are constantly taking place in individual cases throughout the industry. Memories of past benefits are notoriously short, however, and many people no doubt would be genuinely surprised to learn that they were paying less for their electricity than they paid before the war.

Our electric utilities have seen their volume of business fall off, their revenues decline, their earnings drop as a result of the depressed state of business during these last few years. They have not escaped the effects of the reduced level of commercial and industrial activity but have suffered with all other elements of the community. They have had no magic umbrella which sheltered them from the rain of adversity. Despite drastic economies, a number of the operating companies have not earned their fixed charges during the past year and others have failed to earn either preferred or common dividends. But if, notwithstanding this, a majority of them are still solvent, surely this is no occasion for criticism but for congratulation not only from their own but from the public's viewpoint. It is a strange confusion of ideas which would put commodity prices up in order to stimulate economic recovery and at the same time would put utility prices down—when the proper functioning of the utilities is necessary to the success of any recovery program. The solvency of the utilities, insuring their ability to continue to render service, must be preserved if chaos is to be averted. No public interest can be served by forcing them into bankruptcy.

It is not disputed that a rise in commodity prices is essential to recovery and a law has been passed by Congress with this declared object in view. Already substantial advances have occurred in a number of staple products, and the trend seems to be definitely upward. It should be self-evident that greater hope of progress lies in the constructive process of raising commodity prices and increasing purchasing power than in the destructive process of forcing arbitrary reductions in utility rates and destroying utility investments—on the principle that it is better to lift up than to pull down.

For years the utility industry has been urging remedial attention to the mounting tax burden, and now the entire nation is becoming "tax conscious." More and more the State is absorbing the substance of the citizen and the fruits of industry in the form of taxes. The chief effort at correction so far has been directed to reducing the cost of

(*Continued on page* 61)

WHERE DO WE GO FROM HERE?

By ALEX DOW
President, The Detroit Edison Company

A Talk before the First Session of the First Annual Convention of the Edison Electric Institute, Chicago, Illinois, June 5, 1933

The subject assigned to me for this talk is "Where Do We Go From Here?" That is not how the invitation given me was phrased but expresses the sense thereof. I consented to speak—not as a prophet or soothsayer—merely as a man who has grown old in the industry; who has seen all the happenings that have made our industry; and who has himself been a part of many of these. I shall only offer guesses to you. I shall not even offer the platitude about history repeating itself. In our business it probably will not.

Some of my guesses may be good. I hope so, but I don't guarantee them. I am still on the job, and if I guess wrongly so much the worse for me and mine. You see I acknowledge my age but decline to be rated as a museum specimen.

Before peering into the future, it is well to look a little way into the past. Thus—looking backward I recall that here in Chicago and in a June of thirty-five years ago, I read a paper to a mid-summer Convention of the National Electric Light Association. It was presented by request of Mr. Samuel Insull, who was President of the Association. He saw the draft of the paper. I warned him that some of its conclusions might be contradicted on the floor of the Convention, and that was a good guess. Mr. Insull said that the paper was what he sought, in that it would stir up a helpful discussion. He neither approved nor disapproved it.

The reading was given close attention. Thereafter the Convention on motion went into executive session, to clear the floor for free speech, and I got what the irreverent of today call a "panning" that became almost personal. My conclusions most vigorously attacked were these:

That public lighting by contract should be performed at the lowest price consistent with a reasonable profit *on the value of the investment* used for the job.

That in order to adjust prices in the absence of competition, it is necessary that costs be ascertained and prices approved by a competent authority, acceptable to the public as well as to the contracting company.

That in the absence of a constituted authority competent to ascertain costs and prescribe prices, members having public lighting contracts under consideration should endeavor to have the price set by temporary arbitrators, who would be guided by the rule of reasonable profit.

In this meeting in 1933 the enunciation of these principles would be regarded as an unnecessary repetition of platitudinous moralities. In that meeting in 1898 the protest was against the acceptance of present value rather than prior investment or capitalization. That same 1898 was the year in which the Smyth vs. Ames decision was rendered by the Supreme Court, which ruled (among other things) that the present value of the property devoted to public service must needs be considered in setting what we have come to call a rate base. The Honorable William Jennings Bryan preened himself quite a bit thereafter on what he considered a victory. I wonder whether, had he endured until today, he would not find himself changing his position, and insisting that Smyth vs. Ames was a denial of righteousness?

Smyth vs. Ames in 1898 dealt us a few good cards. One which I mentioned in that ancient talk of mine is that to take present value as a base requires accruing depreciation to be allowed as an operating expense. Another card did not show its value until the years of rising prices. The present value theory is lovely in a period of rising construction costs. When costs fall it is another pair of sleeves. In these intervening years some of us overplayed the hand which was dealt us. For myself, I have sought a middle path—I have sought that the present value and the invested capital should not get so far apart that enforcement upon us of either theory would be fatal. I can't say that I have entirely succeeded. I know that under recent conditions my task has been difficult. It may be that holding the middle course is impossible or shall become impossible, but I am still trying to hold it, and have good hope. This is not missionary talk. It just so happened thirty-five years ago that I foresaw the one theory might be Charybdis and the other might be Scylla, wherefore it seemed to me that we should not seek a haven in either. If either now threatens us with shipwreck, we had best back water and set a new course.

Of course consistency is a jewel, but it is a sad handicap. No demagogue considers himself bound by his prior enunciations of principles. He is not obliged to have principles. If our dealings were with the demagogue, we might claim that the game permitted equal laxity to us. But our dealings are with and for the people whom we serve. These may be at the moment represented or misrepresented by the demagogue, but he will pass and be forgotten while our service must endure. Wherefore our strife must not be for consistency but for the wider truth of fair and open dealings.

I have just read the Los Angeles Gas and Electric decision and opinions; both the majority opinion of six Justices of the United States Supreme Court and the minority opinion of two Justices. The remaining member of the Court took no part in the trial. The majority opinion looks at the arguments set up by counsel and restated in the minority opinion, in such manner that it cannot be said they were disregarded; but disposes of them by reversion to first principles, declaring that the distinctive function of the Court is not to sit as a board of revision but to enforce constitutional rights. Further, the opinion says that, being mindful of this distinctive function, it has refused to be bound by any artificial rule or formula *which changed conditions might upset*. Notice these last five words. Then the six Justices say that the judicial ascertainment of value, for the purpose of deciding whether rates are confiscatory, is not a matter of formula; but that there must be a reasonable judgment having its basis in a proper consideration of all relevant facts.

That opinion has incidental merit as a lesson in dialectics. I have been speculating for many years on how the Court would deal with its own rules and its own dicta, when these came to appear to conflict with the necessities of the immediate occasion. The game of arguing a Court into a corner is seldom won—not in this Court, anyhow. In this particular decision the arguments from the Court's rules and dicta were made not only by counsel for the litigants, but were put on record by the opinion of the two non-concurring Justices. What the

six Justices say is (in short) that if and when the ruling brought before it for review shall not in effect be confiscatory, the Supreme Court will not concern itself very much with the reasoning or the figuring which led to the ruling nor in legalistic interpretation of its own dicta in earlier cases.

Looking at these two opinions and remembering Smyth vs. Ames, I am guessing at the lessons now to be drawn. Also, I wonder if we have been dealt any good cards. After several readings I do not find myself being sorry, but somewhat the contrary. We have had in later years an overdose of law and lawing, of formulas and of experts. If hereafter we shall seek and be helped to seek substantial justice, with the knowledge that the ultimate judicial authority will not only neglect trifles (according to the rule, *de minimis non curat lex*) but will judge only the broad issue—namely, whether the decision is effective justice or effective injustice—whether it is confiscation or is not—then we shall be encouraged to dispose of disputes promptly by business methods, instead of leaving them to the law's delays. Nevertheless, giving all respect to the law and to the Court I trust that one or other of the cases now in progress shall, when it arrives in the Supreme Court, have a clear issue of attempted confiscation, and that in its opinion thereon the Court will give us the reverse senses of its present dicta.

It is now an interesting speculation as to whether thirty-five years is the period of a recurring cycle wherein prudent investment shall alternate as a major factor with present value of property. For me that speculation would be academic. I do not intend to be on the job when another thirty-five years shall roll around. But my guess is that present value will continue to be one of the relevant facts to be taken into the reckoning in setting a rate base, and that it will continue to be mighty important.

Here is another of my guesses—that we are coming into a period in which we shall be more outspoken, as an industry and as parts of the industry. We have joined ourselves into this Institute under an agreement which makes each of us answerable in some part for the other. By mutual consent we have taken to ourselves a certain amount of disciplinary authority. That authority is not enough to have dealt with certain detrimentals of the past, nor to effect non-members of the Institute hereafter. It is enough to give appearance of solidarity. I doubt whether we will be rated as a trade association—as one of these whose function under the New Deal is to coordinate output with markets, with Federal support. It is quite certain that we shall not make rates for our membership. In the nature of things we members are not competitors. We have not been cutting one another's business throats, nor are we likely to do so. I guess that the Institute will not have any early spectacular occasion on which to speak for the industry—such an occasion as might cause the speech to become news. If the day shall come when the Institute is thus to speak, then the speaking should be straight talk and in no wise apologetic. There will be less than nothing to apologize for if we fulfil the purpose for which we have organized, and it will be in order for us to tell our critics what we think about them. Such talk will surely be news, according to the ruling that it is news when the man bites the dog.

For the next year I guess that our members will do more local advertising than heretofore: that the copy will be in the common speech of the day and signed by an executive: and that when there is a lie large enough to deserve recognition, we will call it a lie. Whether we shall name the liar is a point on which we had better take advice of counsel. Don't let counsel write advertisements. Listen to good advice but don't let it cramp your style.

I recall that a professional fault finder who remains unmuzzled and unbitten, years ago denounced the Rate Research Committee of the National Electric Light Association as a rate fixing Committee. Our new Rate Research Committee will find some work to do in rate research, but not a great deal. There is little to add to what has been written by the older Committee. But there is a need to reiterate with much force the teaching that analysis cannot make rates; that rates are made for future and not for the past; that rate making is an art not a science. I guess that this teaching will be thorough. We need science, but we need it in its own place. We have with us some good men who continue to think that they can solve any rate problem with a slide rule and a table of constants. On the outside there are doctrinaires who feel that their own painfully acquired arithmetical erudition is adapted to deal with such a psychological problem as rate making. My guess is that in our rate practice hereafter we are going to paraphrase the Supreme Court on valuations—to wit, that all the considerations, including all the pertinent facts, will be studied when we have to make a new rate or alter an old rate; but that the conclusion will be reached by the exercise of reasonable judgment. Analysis can keep us from foolishness in either direction, but only common sense backed up by experience can predict what reaction is to be expected from a new rate.

Here is another guess—that our rate areas will become larger than they have ever been—that there will be an end of the adjustment of rates to each small community. There is no real reason why a rate area and an economic area should not coincide. The extreme case is rural service, wherein much progress has already been made. Notice that when it was our fashion to build rural lines according to the same specification that pertained in urban communities, the dispersion factor was serious and different schedules imperative. But in these days, we have accepted reasonably high roadway voltage, and we build with lighter poles and 400 ft. spans, and the cost per mile has fallen surprisingly. We need cheaper protection against lightning for small rural transformers—possibly better lightning arresters or possibly surge absorbers, but preferably along the line transformer improvement. Even in districts where farms run four to the mile the differences in cost are tending to disappear as between rural service and metropolitan service, and the differentiation of rates is yearly less warranted. This likewise is true—that in the Middle West, the Northwest, and on the Coast the dirt farmer has welcomed the advent of electric service. He has not yet forgotten the days of kerosene and candles, and his good will is an asset.

A corollary of an economic area served under one rate schedule is that industries now cramped and concentrated in large cities are helped to move to smaller communities. Many big industrial plants are going to be decentralized. The automobile industry, which happens to be under my observation, is an example. It is cheaper to ship parts to assembling points than it is to ship complete cars. The assembly plant has just now been overplayed. It has not been adjusted to changes in transportation. When road and rail and water transportation are once more coordinated into the manufacturer's problem, the smaller local unit of production of parts will cease to be handi-

capped in comparison with the centralized factory. Given the same rates for power as in the big city, which has its heavier tax burden and its difficult living conditions, and the smaller country plant will have an increasing advantage.

Still more guesses—I think that we are going to have less technical engineering in management—not in the settlement of day-to-day problems, but in the laying down of broad policies. Our industry is built upon engineering and cannot exist without that foundation. But it should be a foundation. Our business is not to demonstrate a theorem, but to give acceptable service in return for a reasonable payment. There is no use weeping over spilt milk; but I can say without tears in my eyes that our engineers have not always counseled us wisely; and that some of our present technique has surrendered too much to perfection of method, with a loss of commercial usefulness. Even today we are being hurried too fast out of our direct current distributions. These made the industry a commercial success. These today give the best service that is given by any of us. Acknowledging that we cannot run synchronous clocks on direct current, why should we not leave some chance for existence to Seth Thomas and Westclox? Acknowledging that most radio sets are designed to take their energy from alternating current circuits, I see therein no insuperability in these days of tube conversion. In plain, I do not see that any differential of cost which I can pass on to my continuous current customers will warrant them in changing their equipment. And I am not minded to follow a theory of costs into a five-year plan involving large expenditures that must needs be written off. My guess is that direct current distribution is going to stay for a while yet.

About taxes—our industry is a mark for taxation just now—unjust, unreasonable, and even vindictive. I guess that the pendulum is now near the end of its swing in the wrong direction. I guess that the way in which most of us are going to help the reverse swing is to make it clear to our customers that they pay our taxes. I have been advertising that there is only one way in which my company can pay a year's taxes—namely, by collecting them out of the year's business. I guess that we are going to show that we must pass these taxes on, because it is economically impossible for us to do otherwise. And I guess that we are going to drill it into our customers until they understand it—that indirect taxation of themselves through the lighting companies is in most cases a departure from mental honesty by the taxing powers—an evasion of criticism that might hurt political careers; and that it is up to these customers of ours to make the protests that will take taxmasters off their backs as the tax earners. We cannot begin that campaign of education too quickly. It is impossible to be too frank in our expressions. The taxes laid on our customers through us have trebled in the last ten years. We are weary of being tax collectors, even if we are infinitely more efficient in that respect than the officers who are paid to do the collecting.

I have more guesses about the future, but I have offered enough. As I said already, if these guesses are wrong, so much the worse for me and mine. I give these now for what they may be worth to you. I never was burdened by pride of authorship, so if you shall say they are without value I shall not be hurt.

THE PRESIDENT'S ADDRESS

(*Continued from page 58*)

government, and while we all agree this is imperative and applaud the notable results achieved, of even greater importance is the necessity of reducing the *amount* of government. Of what avail is it to reduce the cost of government if the amount of government is to be continually increased? Can any one doubt that the moment pressure is relaxed governmental costs will spring back to their former level, plus the cost of the agencies that meantime have been added? This is one of the gravest problems of the future and its solution will put democracy to the severest test.

The tax burden has borne with crushing force upon the utilities and has reached a point where it is now a serious obstacle to further general rate reductions. Considered in relation to operating income, taxes of electric light and power industry absorbed 27 1/2 cents of each dollar of such income in 1932, compared with 24 cents in 1931 and 22 1/2 cents in the banner business year of 1929. Of each dollar of gross revenue, taxes now amount to 12 cents, and this without giving effect to the host of additional taxes levied by State and federal authorities in this present year of 1933. The plain truth is that taxes cannot longer continue their upward course without halting the downward course of rates. As taxes are part of the cost of operation they must be recovered in the rates, which means that the consumer must pay them as he must ultimately pay all taxes of every kind. The only source of taxes are the pockets of the people. When this fundamental truth is fully understood there will be less complacency in the face of mounting appropriations and there will be a fairer distribution of the tax burden.

The various units of our industry must acquaint their customers and the public generally with the facts of their local situation. The Edison Electric Institute undertakes to present facts relating to the industry at large, for the information of all interested persons and governmental bodies. But each individual company must put its own facts before its local public. It has a responsibility to take a vigilant and if necessary a militant stand against the misrepresentation and falsification that all too often are labeled as facts and circulated to the detriment of the industry. It must make a vigorous defense whenever it is unjustly attacked and so far as possible must forestall attack by keeping its consumers fully advised as to its business, its facilities and its service. The public has a right to know the facts—indeed, must know them—if it is to form just judgments. The public's right is the utility's duty.

We have all been heartened by the signs which have been multiplying of late that at last we are emerging from the long night of depression. Is the light that we see ahead only a false dawn—which so often has raised false hopes—to be followed by still deeper darkness, or is it a real dawn, heralding the approach of day? We are encouraged to believe it is a real dawn and that we are on the threshold not of a new order in which, as some profess to believe, the lessons of history and the teachings of experience will have no validity, but of a new phase of economic and social development in which things will be better ordered *because* of the lessons of history and the teachings of experience. If this is so, and we build a new prosperity free at least from some of the mistakes and excesses of the old, then the reverses of the past few years will not have been without their compensations.

Whatever the future may hold in store for us, our great industry will continue to serve the country's need.

TREND OF RATES

BY F. A. NEWTON
Commonwealth & Southern Corporation

An address before the 1st Annual Convention of the Edison Electric Institute, Palmer House, Chicago, Ill., June 8, 1933

What I may have to say, you will understand, represents my own conclusions, based upon my experience and observation and upon my conception of the effect of present economic and political trends on future rate policies. Kindly accept them on that basis.

It is asserted that the rates of many electric utility companies are complicated and difficult to understand. Much of this criticism is not honest criticism. It comes, to a very large degree, from those who can find nothing good in anything done by a privately owned public utility. Their criticism of the rates for lack of simplicity is but a part of a program of finding fault with and of tearing down private ownership.

Simplicity in rates is a very desirable thing. There can be no argument about that. However, when it may be carried to a point where it prevents flexibility, where it effectually discourages development of business and where it brings about unjust discrimination, then it ceases to be desirable from the standpoint of either the customer or the company.

I hope I may be pardoned if I express the earnest wish that those who sincerely and honestly urge greater simplicity in rates would get together and make up their minds as to just what they mean by simple rates and just what they want. One desires a rate easy to compute and which lends itself readily to accounting. Another wants a rate which will help to sell more appliances to a greater number of the electric customers. Still another thinks of rates solely in terms of the company's relation with the public. Others have other ideas.

One says we should charge for electric service like the milk man charges for milk. Another says we should have prices as simple as the coal man and the grocer. If the milk man and the coal man were compelled to maintain a distributing system throughout the territory they served, if they were compelled to maintain a service connection to each house and if they had to deliver their product at any time of the day or night and for any amount of milk or coal desired by the customer and immediately upon his demand, I wonder if the milk man and the coal man would be able to maintain their present so-called "simple" methods of charging.

If they were subject to State Regulation and if their methods of furnishing service and their methods of charging were under constant scrutiny and subject to periodic investigation upon complaint, I wonder if they would find their present methods satisfactory. If they were under legal restraint to avoid unjust discrimination, perhaps they would find it necessary to consider serious revisions in their present "simple" practices.

The fundamental characteristics of a business cannot be ignored in making the prices for the product or service it furnishes, nor can the commercial aspects be overlooked. A public utility must, under no circumstances, charge an excessive or unreasonable rate. With that as the basis for all rate making, then three rules must be followed. First, the rates charged must be compensatory. They must equal the direct cost of furnishing the service and something in addition thereto for return upon the investment devoted to the service. That margin may not be the same at all times, nor may it be the same for different classes of users. However, it would seem to be a cardinal principle that the rate charged must be sufficient to meet the direct cost of the service and return something on the investment as a whole.

Second, the rates charged must not cause unjust discrimination either as between individuals or as between different classes of users. No class may be asked to carry the burden of a loss incurred in serving another class. No individual customer may be put at a disadvantage as compared with other individuals in the same classification.

Third, the rates must get and hold the business. They must be commercially sound, they must be businesslike. Since business cannot be made to fit rates, then rates must be made to fit business as nearly as may be possible. Flexibility is therefore an essential requisite of a successful rate structure.

The first two rules are understood clearly by all who realize that ours is a regulated industry whose prices must not produce more than a fair return and which, as nearly as may be, should be based upon the cost of furnishing the service. The rule with reference to unjust discrimination is understood because unjust discrimination is illegal and also because it is bad business.

The third rule, that rates must get and hold the business means that they must be promotional. Further it means that they must conform to the characteristics of use of the customer. Further it means that for competitive business, and much of it is competitive, they must meet the cost of operating the isolated plant. It means that they must recognize load factor because load factor primarily determines the competitive costs.

There are many who insist that the so-called "simple" rate is not in the best interests of the great mass of residence customers and does not develop business as well as other forms of rates. It does not seem to have been realized by many that those rates which may not perhaps be termed "simple" were not designed for the purpose of confusing the customers. The desire was not to be technical. The underlying purpose was to make a rate which would be of the greatest advantage in developing increased use among the ordinary average run of customers.

It was realized that it was among those customers living in the five, six, seven and eight room houses, generally without servants, that the greatest comfort and convenience could be secured with liberal use of electricity. It was at this class of customers that the rate schedule was directed, not at those who may use large quantities and who probably leave their houses for one or two months in the winter and for a like period in the summer. The desire was to make a rate which would break quickly for these smaller homes and offer inducement for freer use of the service and make it possible for them to install and operate appliances.

It was realized that with a given amount of reduction in revenue possible,

the more that was given to the larger houses, the less there would be to give to the smaller houses and the farther out the rate schedule would have to break.

I don't believe it can be successfully maintained that as a rule those companies having so-called "simple" rates have any better public relations, have any greater sales per customer, have any lower average rates or are earning any better return. In fact, I am inclined to the contrary belief.

The underlying purpose in the design of rate schedules for residences is to encourage and make possible the use of electricity for those many and varied uses to which it can be put for household comfort and convenience. Revisions in rates are on a sound basis only when they accomplish this purpose. The purpose is defeated if the cost of electricity for cooking, refrigeration, air conditioning and other uses must be kept high in order to take care of losses incurred in serving those who use but a few kilowatt hours per month and at a price less than cost. That a very large number of residence customers is served at a loss is a fact well known in the industry, to all state regulatory bodies and to all who have investigated the facts.

Reductions in maximum rates benefit those customers already being served at a loss. If the rates for these unprofitable customers are made even lower, someone must carry the increased burden of loss and that someone must be the householder who endeavors to take the fullest possible advantage of the economy and convenience of electricity in his home. When these losses become so large and so burdensome that the rate charged for cooking and refrigeration, for example, must be kept above the price at which customers can afford to use these appliances, the result is harmful to the customers generally and to the utility. It is increased use per customer and the resulting greater volume of sales which makes possible lower costs per kilowatt hour sold and in turn makes possible further reductions in rates. When such increased use is discouraged, if not actually prohibited, by still further reductions in the rates to unprofitable users, development in the use of electricity is prevented and many homes are deprived of the full advantages of electricity.

When the facts thus pointed out are overlooked, or are deliberately ignored, then injustice results and the efforts to make rates promotional in character are effectively discouraged. As the price of electricity to customers using but a few kilowatt hours may be reduced still further, it follows that the higher blocks of the rate schedule must be extended to cover more and more kilowatt hours so that the losses may be offset. As the higher brackets of the rate schedule are thus extended, they go beyond that point where the use of electricity for lighting ends and the use for appliances begins—they reach that point where the cost of electricity to the customer will prevent the use of the equipment he desires for his comfort and convenience.

On the other hand, if the losses incurred in serving the unprofitable customers may be confined within as narrow limits as possible, then the low price which will encourage greater use of appliances can be made available at a point where it will have the maximum effect in promoting increased use. It is essential that the low price be put at a point where the great mass of residence customers living in the five, six, seven or eight room houses, and generally without servants, can afford to install and use those electrical devices and appliances which add so much to their comfort and convenience.

All this seems so obvious as not to need restating but the great pressure being brought for political reasons to still further reduce the rate of the customer using but a few kilowatt hours per month, requires a restatement of the facts. It is indeed a short-sighted policy, directly contrary to all sound economic principles and to all well established commercial rules.

A low rate for electricity for residence users is desirable. No one appreciates more than does progressive utility management the reaction to low rates in the way of increased use and greater volume of sales. A policy, however, which deliberately prevents the making of low rates for those who are entitled to them by increasing the losses to the unprofitable users, is not in the public interest.

Those who urge a reduction in maximum rates do so chiefly to satisfy political expediency. At the same time they realize that in order to get back the loss in revenue they must increase the use per customer, they must sell more lighting and more appliances. Therefore, they want a form of rate that will do this thing. They want a promotional rate. They want to reduce the rate at both ends, not seeming to realize that the more they take off the top, the less they can give at the bottom, that the more they do to satisfy political expediency, the less they are able to do to make the rate truly promotional. This is particularly important where it is desired to increase the use of electricity for cooking.

In this connection, however, I want to call attention to the favorable position in which those companies which have adopted promotional rates in the past find themselves. To illustrate, I have in mind a company which has a rate schedule for residences of four blocks, 9c-6c-3c and 2c, based upon load factor. That rate schedule has been in use for a number of years. Today 60 per cent of the current it sells to its residence customers is sold at the 3c and 2c blocks. Less than 20 per cent is sold at the 9c block.

Now it is evident that a reduction in the maximum or top rate of this company, namely, the 9c rate, would be of much less consequence than if it were selling 40 per cent or 50 per cent at the top rate. Obviously, this company may, if it seems advisable, make a reduction in its top rate with much less serious effect on its revenue than the company which may have a 7c or 8c rate, which applies to probably over half the current it sells. This is worth thinking about.

Many reductions in residence rates have been made by orders of Commissions or by voluntary action on the part of the companies. There has been—there is now—great pressure to reduce the price of electricity to domestic users. The reason for this is obvious. There are 20,000,000 homes using electric service. The large number of voters here represented has a great appeal to the politicians.

The constant reduction in rates to household users has brought about a situation which many do not fully realize, namely, that in many sections, residence rates are today lower than retail commercial lighting rates. I am not speaking of the individual store as compared with the individual home. There are residences entitled to lower rates than some retail commercial customers and there are also stores clearly entitled to rates lower than residences. I am speaking of the residences as a class and the retail commercial customers as a class.

I have heard the argument that this situation is as it should be from the standpoint of the cost of the service as well as from the standpoint of the value of the service to the customer. I confess I have been unable to follow this contention.

The argument has been advanced that

lower rates for residences than for retail commercial establishments is sound from the commercial or ousiness getting standpoint. It is asserted that the field for the development and use of electricity is greater in residences than in commercial establishments. It must be granted that there is a much greater number of residence users and a wider field, but when one considers the opportunities in stores, restaurants, theatres, etc., for air conditioning, sign lighting, refrigeration, window lighting and better interior illumination, the possibilities of this class of business loom pretty large.

I am convinced that in the desire to reduce residence rates the companies and commissions have not given due recognition to the retail commercial customers and have failed to appreciate the reaction of this class of users to more promotional rates. Especially at this time, when it seems quite evident that industrial conditions are improving, does it seem desirable to give more consideration to the possibilities in the retail commercial business and more attention to the rates for this class of business.

A large additional volume of electricity can be sold by most, if not all companies with no increase in investment and therefore with no added fixed charges. Present generating capacities will absorb a materially greater power demand.

This means that large power loads are very desirable under present conditions—that the cost of handling such business will be confined very largely for several years to production costs. How long this situation will continue no one knows.

New industries will undoubtedly arise—new processes will be found which will require power in large volume. Industry generally may come back faster than now appears likely. There is, however, a very pressing desire to sell more electricity and to load up idle equipment at this time. It will be argued by some that a price which has but a narrow margin over and above bare production costs would be remunerative.

Sooner or later, however, the surplus capacity will be absorbed. New equipment and new investments will be necessary, bringing added fixed charges. It would then be necessary to see that the power loads added at such low rates take up their share of the fixed charges.

It must be remembered also that this is a regulated business. It is true that regulatory commissions concern themselves but little with the rates for large power customers, except to see that they may not be so low as to throw a burden on other users. Large industrial establishments purchasing power do not need the protection of the commission. They are amply able to take care of themselves. They buy power because it pays to do so.

Unjust discrimination, however, is prohibited by law. It is the duty of the commissions to remove unjust discrimination as between large power users as well as between small light and power customers.

In my judgment, in view of these facts it would seem that such low rates to take on added loads of the character mentioned should not be made. In any event, these rules must govern.

First—that the company must reserve the right to withdraw such power rates offered under present conditions when these conditions cease and when it becomes necessary to provide greater generating and transmission capacities. Second—that whatever rate may be made it must be available to any and every customer either existing or prospective whose character of use entitles him to such rate.

Companies have experienced difficulty in these times in applying power rates with a demand charge. Power customers naturally are trying to cut their costs and while, as a general proposition the cost of power is a very small part of the cost of manufacturing most products, the power bill attracts attention because in many cases it runs into a good many dollars. The customers' attention is directed to the demand charge part of the rate and this is generally the target of his complaint.

It is unnecessary, of course, to repeat that power rates are competitive. They must meet the competition of the isolated plants.

When that day comes, when this industry and our competitor, the isolated plant, can find a way to eliminate or suspend fixed charges, then fixed charges will not be a necessary part of the rate charged for power service. But until that day comes, fixed charges will be a part of the cost of furnishing service whether it be furnished by the utility or by a separate isolated plant.

There has been some demand for a power rate which not only eliminates demand charges but is so designed that during periods of low manufacturing production, the cost of power will be in proportion to the amount of the customer's production and that during the period of high industrial activity, the power customer will pay a higher rate. In brief, this idea is that of an Equalization Reserve. During periods of industrial activity, there shall be set up a reserve accumulated by higher power rates so that the utilities may charge lower rates during the period of depression, equalizing their earnings by the reserve accumulated during good times.

I think there are two chief objections to this idea. The first, and I say this with all fairness to the usual manufacturer, is that he will not pay that higher rate during the period of industrial activity. If he finds the rate higher at the time than he can produce the power for himself, I am very much afraid he will forget about the arrangement for the equalization reserve and put in his own plant.

The second objection to the plan is that I doubt that the state regulatory commission would approve the idea. I am afraid they would object to it during periods of industrial depression as throwing a burden on the residence customer. I am also afraid that they would have many complaints during the period of industrial activity from the power customers themselves.

It would be very easy to make a simple rate for power customers and with no demand charges. All one has to do is to determine the average revenue per kilowatt hour received from all power customers and charge that rate for all power sold. The obvious result of such a simple rate would be, first, that a large percentage of power customers would be served at less than cost and at less than the value of the service to them. On the other hand, the rate for the large and good load factor power users would be higher than the cost of serving them and higher than they could serve themselves and the business would be lost.

The next suggestion to meet the objection above outlined is to have a simple quantity rate schedule beginning with a top of, say, 8, 9 or 10c per kilowatt hour and going down to a rate low enough to secure and hold the large power users. I can hear objections to this plan. Quantity alone does not determine either the cost to the customer of serving himself or the cost to the company of serving the customer. Such a form of rate with no regard to load factor would be prohibitive against many customers, not large in point of demand but having extremely good load factor and constituting very desirable business.

It will be said that if the simple quantity rate schedule will not work,

(Continued on page 96)

TAXATION—THEORY AND PRACTICE

BY W. C. MULLENDORE

Executive Vice-President, Southern California Edison Company, Ltd., Los Angeles, Cal.

An Address Delivered Before the Fourth Session of the First Annual Convention of the Edison Electric Institute, Chicago, Ill., June 8, 1933

Most of us are exhausted not only by the burden of taxation itself but also by the burden of talk concerning it. We know that taxes have risen to their flood tide while the tide of trade and production has been ebbing. We know that the portion of the national income taken for taxes has risen in less than one generation from one-twelfth to one-third. We have been told that the national debt, public and private, has risen until it is almost if not quite equal to the national wealth. We know that taxation has drained and is draining purchasing power to such an extent as to stifle the growth of production and distribution of goods. We have been told these startling facts so often that they have ceased to be startling and are almost boring.

We have heard on this program of the hopes and endeavors of the engineers of our industry in lowering costs in the fields of generation and distribution. They have told us that the greatest obstacle to lower cost is the item of fixed charges, and when we examine the field of fixed charges, we find in a most prominent position this item of taxes. The benefit to the consumer of the years of effort in laboratories and factory which have resulted in lowered costs of production and distribution may be nullified by a single act of the taxing authorities through the increasing of fixed charges. The success of the engineer in lowering costs by increasing efficiency through higher temperatures and pressure in boiler chambers often are thus offset by the still higher temperatures and pressures prevailing in legislative chambers. Hence, though we may be tired of the subject of taxation, it remains in a position of controlling importance because, as was said by Mr. George T. Buckingham in his splendid address on this subject at the National Electric Light Association Convention in Atlantic City last year: "Instead of being an incident, taxes have become the most important and the most serious single fact in the affairs of every citizen." That being even more true today than it was one year ago, we must continue to try to do something about the tax problem.

The angles to the subject are exceeded in complexity only by the number of avenues through which the tax-collector reaches our pocketbooks. I have thought we might make both a novel and refreshing approach to the subject by considering some of those old-fashioned things which were once referred to as "fundamental principles," or to some of the old theories of taxation, and to the relation between taxation and business depressions.

We are living, at least we have been living, in what is termed an exchange economic order. This economic system, the outlines of which are becoming somewhat blurred, has been one in which the great bulk of transactions or the main-stream of business consists of the exchange of goods and services. Business, in its broadest sense, is the exchange of goods and services. The healthy or normal business is largely confined to those transactions in which the two or more parties to a particular exchange mutually benefit from such exchange.

Now, in this economic order which is based upon the exchange of goods and services, transactions in which goods and services are taken without anything being given in exchange, tend to upset the existing economic order by destroying the balance or reciprocating power which keeps up a healthy circulation of goods and services. The taking of something for nothing carried on indefinitely or on a large scale results in that destruction of purchasing power which is the outstanding characteristic of a depression.

Business depression is a term describing a condition of stagnation in circulation or a low volume and rate of flow in purchasing power. In dealing with fundamentals and in endeavoring to get a perspective of the depression picture and the relation between the depression and taxes, we may be helped by an analogy. Let us visualize the purchasing power as a great stream. Trade and commerce are sustained by this stream and both the volume and the rate of flow of trade and commerce are largely determined by the volume in the great stream of purchasing power. Now, let us further visualize two diversion channels leading off from the stream of purchasing power, one of which represents productive and the other non-productive expenditure.

Productive expenditures are those which so benefit the purchaser that his purchasing power is increased, or at least not diminished. We believe there are no better examples of productive expenditures than those which enable the purchaser to make increased use of electric energy. Diversions from the main stream of purchasing power into the channel of such productive expenditures are temporary diversions only, and finally are returned to the main stream of purchasing in increased volume.

Non-productive expenditures, on the other hand, decrease rather than increase the purchasing power of those who make them. Diversions from the main stream into this non-productive channel result in a permanent depletion of the flow of the main stream and consequently of the volume of trade and commerce which can be borne thereon. Where non-productive expenditures predominate over a sufficiently long period, there results that diminution both of volume and rate of flow which we term a "business depression."

Taxation enters the picture here because a large proportion of the tax expenditures are either relatively or absolutely non-productive. Of course, governmental bodies are not alone in making non-productive expenditures. In the late lamented era of prosperity, a very large proportion of our goods and services in the United States were exchanged, both internally and externally, by private citizens as well as by governments, for promises to pay. It now seems doubtful whether we are going to be able to collect on many of these promises to pay. If we cannot collect, something has been given up in exchange for nothing and that has tended to upset the economic order. Other forms of non-productive expenditure might be detailed, but of them all, the most persistent and burdensome has been that of taxation, which, year by year, has forced diversion into the non-productive channel of increasingly larger amounts of purchasing power. Thus has been created what some

have termed mal-adjustment—a lack of balance between the supply of useful goods and services and the power to purchase those goods and services. A little mal-adjustment may be of slight consequence. Too much mal-adjustment may mean deformity or even necessitate a major operation if the life of the victim is to be saved. We have almost reached the major operation stage.

Once upon a time, when the relations between government and citizen were of a simple character, it was comparatively easy for the citizen to see what he was receiving in exchange for his taxes, just as it was easier for the government to determine the citizens' ability to pay.

But times have changed, and as they have changed, governments have assumed new duties and new functions—new bureaus, new boards, new departments, new commissions, and thousands of new agencies which furnish the citizen not only with protection but with attentions and cares undreamed of in the simpler days. With this change it has grown increasingly difficult for the taxpayer to determine what he receives of value from the myriad functions which the government performs, and increasingly difficult for governmental agents and agencies to levy taxes in proportion either to ability to pay or to benefits conferred. Of one fact we may be reasonably sure. We are not receiving from government benefits which justify the taking of one-third of the national income, which means that we work, if we have work, 100 days out of each year to pay the expense of government.

In the first year of our independence, Adam Smith published his masterpiece "The Wealth of Nations" in which he stated as one of his four maxims of taxation that "every tax ought to be so contrived as both to take out and keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the State." He may have referred to the ethics of the publican, but what he said 157 years ago has a very real significance today when the taxpayers are deprived of enormous values which do not reach the public treasury.

No citizen has a right to complain of just taxation. But the true test of any tax is whether it is in the public interest. All citizens have both the right and the duty to complain of destructive taxation. The destructive effects of taxation generally arise from one or the other of two sources: Excessive taxation or discriminatory taxation. Both of these misuses of the power to tax result in depriving the taxpayer of more value than the tax-collector receives. The electric utility industry is today suffering from both excessive and discriminatory taxation but particularly from that discrimination which imposes burdens on this industry not borne by its competitors.

The public as a whole is vitally interested in the maintenance and growth of purchasing power. Many of the proposed remedies for the economic woes of the day have as their objective the revival and creation of a widespread public purchasing power. So important is this deemed that new tax levies are proposed for the purpose of providing money with which to create purchasing power. What then shall be said of taxes which are so devised as to destroy much more widely diffused purchasing power already in existence than can be recreated by the expenditure by government of the tax-money so raised?

For example: Taxes are reducing, and in many cases actually are stopping dividend and interest payments. These payments are owing to those whose savings have purchased equipment and plants. Interest and dividends are rental payments for that equipment. Too few people understand that Big Business as it exists today is merely the result of the pooling of the savings of millions of investors in modest circumstances, either through insurance and savings accounts or through direct stock holdings. As Mr. Hagenah recently pointed out before a committee of the United States Senate in Washington the operating power companies of the United States are owned by 1,535,000 stockholders, 70,000 of whom are employees and 1,100,000 of whom are customers of the companies. Payments for the use of their money mean a widespread diffusion of purchasing power. Conversely, a diversion into the coffers of government of the earnings which should have gone to pay these people for the use of their savings means a widespread contraction of purchasing power. It means more than that. Inasmuch as values are dependent upon earning power, the disappearance of net earnings means widespread destruction of values. For example, the proposed imposition of a three per cent tax upon the gross earnings of the electric utilities by the Federal government would divert that proportion of the earnings of these utilities which are required to support the value of money invested. Thus, while the Federal Government might derive 25 millions of revenue, the destruction in value of savings invested in utility equipment would amount to several times 25 millions. Again, the taxpayer would be deprived of many times the value which the tax collector received, and if the money so diverted into the public treasury is spent on a non-productive undertaking, the loss to the public is increased many fold by diverting capital from productive to non-productive uses.

These taxes which stop interest and dividend payments are merely examples of taxation which designedly or otherwise result in "capital levies." A capital levy, whether frankly imposed for the purpose of redistributing wealth or whether imposed through ignorance of its real effect, results when the owners of real estate, manufacturing plants and of other real and personal property are taxed beyond the earning power of that property so that the only way in which the tax-bill can be met is by turning over a part of the thing itself to the tax-collector, or by attempting to sell all or a part for cash with which to pay the tax-bill. Most physical property is wealth only as it is in use and it cannot be taken apart and divided up among constituents of tax-levying bodies without destroying its values. That which is often attempted is the sale of the property for cash. But when there are many taxpayers attempting to sell in the same market, we find a dearth of cash-purchasers and a glutted market in which values are but a fraction of what they should be. Thus the taxpayer is deprived of great value and the State receives but little. Something of this process has been going on in more than one city and State of the United States. That it has resulted in the more equitable distribution of wealth is questionable, but that it has resulted in the destruction of enormous capital values is unquestionable. All should be able to agree that taxation having such results is not in the public interest.

Another glaring example of taxation destroying more wealth than is received by the public treasury is to be found in those taxes which prevent the reduction of rates to millions of users of public utility services. Lower rates encourage increased use and increased use means more production—a growth of goods available for exchange, which means a growth of business and of purchasing power. Denial and postponement of rate decreases caused by government taking that which should have been available for consumers again results in the destruction of more purchasing power than can possibly result from

the expenditure by the government of the sum so collected. That the electric utilities desire to and will make rate reductions voluntarily unless prevented by unduly high taxes is amply proved by their record. During the period of prosperity, and even during the present period of rising taxes and declining revenues, numerous rate reductions have been granted voluntarily by companies operating in all sections of the country. As an example, I cite the case of the company with whose activity I am most familiar. In the past nine years, that company made eight major voluntary rate reductions, and during a period when other living costs were rising, the domestic lighting rate within its territory was reduced by 50 per cent. Likewise, generally throughout the country the trend of the curve of electric service cost has been downward, while the curve of living costs was rising, and today the curve of the electric cost remains well below that of average living costs. These electric utilities did not seek to and were not permitted to participate in the profits of prosperity, and as a consequence they have no large cash reserves upon which to draw for operating losses during the period of depression. A discriminatory tax rate which threatens to stop rate reductions to consumers and to confiscate the savings of the hundreds of thousands of owners of these utilities is neither fair nor conducive to national recovery.

We find that the tax burden on the users of our service is greater than ever before. From a gross income of $1,833,000,000 in the calendar year 1932, the electric light and power industry paid approximately $217,000,000 in taxes, or an average of 12.25 per cent, and something approaching 50 per cent of its net income. The portion of gross taken by taxes increased in one year by at least 2 per cent, or from 10.2 to 12.2 per cent. In some companies the proportion of gross taken for taxes has risen as high as 17 per cent. This increase in total sum of taxes paid has of course taken place during a period when earnings were declining.

Some three years ago, a great deal of public attention was attracted by a statement made by one of our prominent ambassadors criticizing the fact that the cost to the user of electricity was so many times the cost of its production or manufacture, and he called attention to the fact that electrical energy from the most modern and efficient plants was produced at a cost of from 3 to 4 mills per kwhr, while he criticized the fact that it was sold to the ultimate domestic consumer at a price several times this cost at the plant. He failed to take into account the fact that the principal costs of domestic electric service are incurred after the electricity leaves the manufacturing plant. Nevertheless, those who are impressed by his statement should also be interested in the fact that the tax burden alone per kwhr is today approaching the cost of its manufacture.

The cost of the raw material—fuel or falling water and labor—is no greater than the tax per kwhr. As an example, the tax burden per kwhr on one of the large companies with whose costs I am familiar was in 1925 1.26 mills. But in 1933, the tax burden promises to be not less than 2 mills. The discriminating character of our tax burden can be better appreciated when this rate per unit of manufacturing cost is compared with the burden on competitive sources of power.

Still another example of discriminatory use of the taxing power which results in the destruction of more value than the tax-collector receives is to be found in the levying of tax tribute upon the electric and other private industries in order to obtain capital with which to build governmentally-operated and tax-exempt competitive enterprises. This use of the taxing power to destroy property already devoted to the public service and to compel taxpayers thus to furnish ammunition for their own destruction is an abuse of this sovereign power of taxation such as has been seen but rarely in modern history. Yet for years the railroads and other business enterprises of the United States have suffered from this use of the power of taxation, and today we have more than one example of its use against the electric utilities.

Closely allied with this affirmative use of the taxing power in value destruction is the negative use of the same power by failing to use it in the taxation of certain special interests, proprietary governmental enterprises which operate side by side with privately-financied taxpaying enterprises. The differential in operating costs which the government thus creates for its own creatures confiscates the investment in the tax paying utilities and through this destruction of value threatens the existence of the sources of taxable wealth. This discrimination in the imposition of tax burdens has not been and can never be justified on logical grounds. The proprietary enterprise which is financed by the use of public credit is given a great advantage over its privately financed competitor in the use of that tax-exempt public credit. Why, then, the further enormous advantage of freedom from taxes for the property devoted to the same uses as that of the privately financed tax-paying competitor? From privately-financed electric utilities in many States of the Union today the taxing authorities take as I have before pointed out from 13 to 17 per cent of the gross receipts while their municipally or publicly financed competitors keep all their receipts free from taxes. No industry can stand such discriminatory treatments. Not only is such treatment unjust and unfair and a perversion of the powers of government; it results in deceptive and misleading statements as to the relative performance of publicly and privately financed utilities; it sets up inequalities between users of electric service; and it immeasurably retards and threatens the improvement of essential public services. There is today great public concern because of threatened impairment of railroad service and loss to railroad investors, and powers of government now are being utilized in an endeavor to prevent threatened injuries to railroad owners and users, which threats have much of their origin in discriminatory burdens imposed by government in the past. Is it too much to hope that we can profit by this experience?

These problems which I have thus briefly outlined are but typical of many others which arise out of and are created by excessive and discriminatory taxation from which our industry is suffering. The list is inexhaustible because new angles to these problems arise daily. The principal question before us as managers and employees of these public service companies is: *What shall we do about it?*

For at least three years the public as a whole has become increasingly tax-conscious. Taxpayers' leagues and associations, tax-reduction clubs, chambers of commerce, realty associations and thousands of other agencies have been crying loudly for reduction of the tax burden. Every candidate for office has had as the first plank in his platform the reduction of taxes. There has been no lack of effort in tax reduction, and in some localities progress has been made.

We of the electric industry have joined in these protests as to excessive tax burdens, but we have now more occasion than ever before to complain not only of the size of our burden but of the discrimination practiced against us. Why this unusual burden upon a commodity and service which is in such common use? Is it to be explained by the

feeling that the electric utility is an easy goose to pick? Perhaps it is in part to be explained by a remark attributed to one of our national legislators to the effect that while it is true that the power companies are in many instances paying unjust and discriminating taxes and while those who have studied the problem know it and you who are operating the companies know it, the difficulty from the standpoint of those who have the responsibility of levying the taxes is that the public generally does not know it. Legislators, he pointed out, are compelled to take into consideration what the voter thinks the facts are, even though the facts may be somewhat different.

The tendency on the part of the public is to visualize a power company as a small group of wealthy individuals who are simply selling a service to the public and who are chiefly interested in profits. There are those who find it helpful to cultivate this picture of the power companies as a means of advancing their theories as to public policy in the power industry.

In part because of the endeavor of those whose purpose it serves to create the opposite impression and in part because the public has been slow to discern the facts, the true situation has not yet been brought home to the public.

The truth is that we who are operating these properties do not own them. We are operating them as trustees, not only for the hundreds of thousands of people whose savings are invested in them but also as trustees for the twenty-four million customers whom we serve. That is, we are trustees of widely distributed plants and properties upon the proper maintenance and operation of which the functioning of the daily life of a hundred million of our fellow citizens in store, factory, workshop, on the farm and in twenty million homes, is dependent. It is our primary duty to protect this vital service against deterioration and interruption and if we do not do so, we fail in the discharge of our trust.

As I have said, no citizen has a right to complain of just taxation; but there is no right more solidly interwoven with American history than the right to protest and seek relief from unfair and unjust taxation. Indeed, our nation owes its existence to the effective assertion of this right.

This industry, through the agency of which it is our privilege to serve, has been the object of one of the most vicious attacks ever directed against a single industry in American history. Although we have recognized that some of those joining in the attack have been sincere, even though misinformed, we have been aware also that much of the unfair, misleading and destructive criticism was engineered by a minority group who have a special interest in the substitution of political control for private management of the public utilities of this country. I have heretofore paid my respects to that group in an address at Atlantic City two years ago and I know of no reason for changing the views that I there and then expressed. Those of our critics who were sincere and who wished to be fair have been met more than half way but the attack from the special interest group continues.

We see this group today working diligently in the halls of Congress and in our state legislatures seeking to make still further use of the weapon of taxation in the accomplishment of their aims.

I am aware that there are those within the industry who feel that it is not incumbent upon us as managers and trustees of these properties to do more than make the facts known to the legislative officials of the government. Some feel that the statement of facts to our customers will be attacked as propaganda and hence that it should not be done. Others feel that our stockholders are interested only as investors and not as owners and that they should not be disturbed. I do not agree and hence I do not attempt to state the position of the industry. But it is my personal view that our duty will not have been discharged until and unless we make known clearly and directly to those whose interests are primarily jeopardized, namely, our customers and our stock and bondholders, the fact that these properties which we are managing are today being placed in serious jeopardy by discriminatory uses of government powers.

I believe these facts should be clearly and directly stated to our customers and to our stockholders because it is their representatives in legislative halls who are primarily responsible for this misuse of governmental powers, and it is to these customers and owners that the legislator must answer.

If, after we have clearly and forcibly brought these facts to the attention of those who are directly concerned, no action is taken, at least our duty will have been more completely discharged. Ours is a heritage of a great industry which carries the banner of progress and is in the vanguard of all industry in the advancement of modern life, as is visibly attested by the exhibitions which we have witnessed here at A Century of Progress.

It is and should be expected of the trustee-managers of this industry that they will exert their best efforts to pass on to future generations an industry unimpaired by abuse and constantly growing in usefulness as the principal servant of mankind. To achieve that aim, the industry must be protected not only from physical deterioration, but from those who are seeking new sacrifices to offer up on the altar of demagoguery. Other great industries have learned to their sorrow that the forces of demagoguery deal blows which cannot be repaired by engineers or scientists. We live in a world where these forces are, and will continue to be, free to operate, and whether we like it or not, we must take them into account in all our calculations for future progress. This present threat from discriminatory taxation is but another phase of a never-ending battle against these forces of disintegration.

EDUCATIONAL COURSES

The seven Educational Courses formerly offered by the N.E.L.A. through its Educational Committee have been transferred to the Chicago Central Station Institute, 72 West Adams Street, Chicago. The Chicago Institute will undertake the administration of the educational courses in the same manner they were formerly handled. The Chicago Institute is under the direction of Mr. Fred R. Jenkins, who was chairman of the Educational Committee during the time the N.E.L.A. offered the home study courses.

In 1914 the facilities of the Chicago Institute were offered to the N.E.L.A. through the Commercial Section, and the first course in Commercial Engineering was prepared by the Chicago Institute. Since then the other courses were prepared by the Institute through cooperation with the N.E.L.A. These courses have been used extensively during this eighteen-year period, and have proved extremely valuable as evidenced by their adoption by many companies in their educational plans.

It is felt that member companies of the Edison Electric Institute will be pleased with the announcement that the educational courses will be conducted without interruption and in the same efficient manner as before.

A further announcement regarding the courses will appear in a later issue of the BULLETIN.

EVALUATING OUR NATIONAL COORDINATED PROMOTIONAL PROGRAMS

BY J. E. DAVIDSON

President, Nebraska Power Co., Omaha, Nebraska, and Chairman of the Electric Refrigeration Bureau

Address Before the Second Session of the First Annual Convention of the Edison Electric Institute, Chicago, Ill., June 6, 1933

There are two yardsticks by which we must take measurement in evaluating any service of the electric industry. To determine the value of the several co-operative promotional programs which our industry has fostered, one yardstick by which we measure is the benefits to our customers—in making our electric service more useful to them, in bringing more happiness and comfort into their lives, in eliminating drudgery in their homes and in their workshops.

The other yardstick is the results to the material side of our business, because, in the final analysis, our revenue must prove the success or failure of any endeavor, be it individual or cooperative. There is no general denominator which would make it possible for me to present to you actual figures of dollars gained as a result of all of these cooperative activities. In some of our undertakings, we can easily figure the increased revenue; in many instances, figuring would be only guesswork.

Of these things we are certain: our promotional activities have developed a finer service to our customers; our co-operative enterprises have produced a finer trade relationship, creating greater sales, with the result of greater kilowatt-hour consumption.

I shall endeavor to recall these co-ordinated campaigns to your memory and to outline briefly the scope, objectives, and results. Therefrom we may see what logical conclusions can be drawn, so that we may ascertain whither the whole cooperative movement is tending.

THE BETTER HOME LIGHTING CONTEST (1924-1925)

The Better Home Lighting Contest was strictly non-commercial. The lighting industry in no way during this campaign broke faith with the school authorities and the public in its pledge that this project would not have any commercial aspect.

Our chief objective in this activity was to make certain that people generally, including children, would be fully aware of the benefits of proper illumination, especially preservation of eyesight, and how easy, practicable, and economical it is to have proper illumination in the home.

In order to create nation-wide interest, a Better Home Lighting Contest was conducted among the school children of the public and parochial schools of America. A number of valuable prizes were offered. First prize was a $15,000 electrical home, completely equipped. There were also ten college scholarships, ranging from $1,200 to $300 in value. A prize of $5,000 was given to the American Institute of Architects for the best designed electrically equipped home. The winning design was used in building the Prize Home, and for building electrical homes in 105 cities.

With the cooperation of the school authorities, 2,000,000 primers, containing non-technical information about home lighting, were distributed to the school children contestants. After studying these and the lighting in their own homes and the home of two neighbors, they prepared their essays.

Funds for headquarters and national activities were subscribed by manufacturers of home lighting equipment. Local funds were raised by the lighting industry in each community, for local promotion.

It was hoped that 1500 communities might be interested. Actually, 4784 communities were organized, and 40,000 persons were actively engaged on local and national committees.

Following is a quick summary of the scope of the campaign:

Population affected	50,000,000
Communities with schools co-operating	3,000
Total pieces of promotional material distributed	10,057,000
Total primers distributed	2,000,000
Total essays submitted	1,000,000

What a stupendous task it was to encourage two million school children to study the primers on proper illumination, and to obtain essays from one million of these children! Picture in your own mind the resultant good obtained from these studies, because the children conferred with their parents and their neighbors in the preparation of their essays.

It requires no imagination to see the tangible results of the Home Lighting Contest. You may see them in the sharp contrast of general lighting practice in most homes today, as compared with the homes of eight years ago. There are more lamps; the kilowatt consumption per home for lighting is higher. There are fewer bare lamps, more scientifically designed reflectors, less glare—less "raw" lights. Unsightly cords, stretched from ceiling outlets, were not uncommon in 1925; they are rare in 1933.

I think lighting men everywhere agree that the actual betterment which has come about in home lighting practice is due more to this campaign than to any other promotional action. While the campaign was not commercial, most gratifying commercial profits have followed.

THE INDUSTRIAL LIGHTING CAMPAIGNS (1925-1926)

For a period of years following the depression of 1920, industrial business was in its golden age—the era of mass production was climbing toward its peak. The situation offered a great opportunity to the manufacturers, sellers, and installers of factory lighting equipment. It offered desirable new revenue possibilities to the central station.

So keen were factory executives for any equipment that would increase production without increasing labor costs, that we had but one problem—to convince them that improved factory lighting did increase production, improve quality, and reduce accident hazard. But it was not easy to sell them this relatively new idea.

Funds of $100,000 were raised, and a geographic organization was set up as in the Home Lighting Contest. Advertisements were featured in national and trade papers. Direct mail material, booklets, lectures, slides, films and newspaper ads were prepared for local use. Permanent exhibits were set up in several major cities.

The objectives of the campaign were:

1. To organize an energetic direct-selling campaign to industrial plants.
2. To form one complete and uniform plan of action.
3. To stimulate local people to sell proper industrial lighting.

As a further stimulus, a prize contest within the industry was inaugurated, and $5,000 in prizes was distributed.

Let us look at the results of the Industrial Lighting campaign:

Total number of factories which bought new lighting equipment	18,300
Value of reflectors sold	$2,230,000
Value of wiring accessories and contracting	$5,630,000
Total added load	90,500 kw.
Total new added central station revenue as based on a single year	$4,345,000

THE NATIONAL FOOD PRESERVATION COUNCIL (1928-1929)

In the latter part of 1927, electric refrigeration was beginning to receive public acceptance. However, in carrying on selling campaigns of domestic electric refrigeration, manufacturers and distributors found themselves confronted with many common obstacles. The public was colossally ignorant about food preservation. Only 40 per cent of American families employed refrigeration of any kind, and only a very few used refrigeration the year around.

Thus the salesman for electric refrigerators had first to educate his prospective buyers and bring them to a state of mind where electric refrigeration could be discussed.

Manufacturers of electric refrigerators, in conjunction with the central station industry, decided to carry on cooperatively a campaign of public education. The Home Lighting Contest was drawn upon as a pattern. Approximately $350,000 was raised from manufacturers. Further cooperation was enlisted by gaining the endorsement of the Federated Women's Clubs, the Bureau of Home Economics of the U. S. Department of Agriculture, and several other national organizations.

The aims of the Food Preservation Activity were to place permanently in the public mind the causes of food decay and bacterial growth, the relation of health to food spoilage, the vital need, from the standpoint of health and economy, of year-round refrigeration.

Specifically, the aim was to establish 50 degrees as the dividing line between adequate and inadequate refrigeration. Around this thought was built the trademark and slogan—*"Below 50 Degrees Lies Safety."*

A strong campaign of national and local advertising was planned and executed, culminating in September, 1929, which was set as National Food Preservation Month. The outstanding promotional feature was an essay contest in which 50,000 essays were received and $25,000 in prizes was awarded.

The campaign succeeded admirably in its object of instructing the public about the proper care of food, in making it temperature-conscious, in establishing the need for adequate year-round refrigeration in every modern household.

The campaign reduced sales resistance—it made the electric refrigerator salesman's job infinitely easier. That could be translated into dollars far in excess of the cost of the campaign, if there were only some medium of evaluation between more sales and less sales resistance.

THE ELECTRIC REFRIGERATION BUREAU (1931-1933)

The Electric Refrigeration Bureau was, in a way, the outgrowth of the National Food Preservation Council, but its aims are entirely different. The Food Preservation Council was non-commercial in its objectives. The Electric Refrigeration Bureau, as its first move, set a national sales quota, and its every effort has been to increase the sales of electric refrigerators. All sales outlets are urged to use the Bureau slogan, "Invest In An Electric Refrigerator," and all appropriate promotional materials the Bureau offers.

The Bureau became operative in 1931 on a three-year program, funds for headquarters activities being supplied by the leading manufacturers of electric refrigerators. Regional and state directors were chosen, and field work was immediately started to establish local Bureaus.

The aims of the Bureau are:

1. To harmonize the sales efforts of the industry.
2. To synchronize sales effort of all selling agencies of electric refrigerators, as hardware and furniture dealers, department and music stores, and electrical dealers, during definite and favorable sales seasons.
3. To carry on continuous national and local advertising plans to stimulate sales.
4. To establish a national sales quota and to work toward reaching that quota.
5. To set up local Bureaus and to aid them in accomplishing their part of the Bureau aims.

By the end of 1933, the manufacturers' subscriptions of more than $600,000 will have been spent for national advertising and administration purposes. More than $5,000,000 will have been invested in local promotion from funds contributed by central stations and local sales outlets.

While not listed among its objectives, a major purpose of the Bureau has been to create sales for the selling agencies of the manufacturer, and to increase load and revenue for central stations. A close check-up of every sale made—local, state, and national—furnishes us exact information of the increased sales of this desirable load-building appliance. It is easy to ascertain the increased revenue brought about. For example, in 1931, the sales quota was set at 1,000,000 new electric refrigerators. Our records show that 960,000 were sold. In 1932 the quota was again set at 1,000,000 refrigerators, and we realized sales of 76 per cent. The present sales results for 1933 give promise of betterment over 1932. It is estimated that 1931 sales alone added $27,000,000 to the annual revenue of central stations, and the retail volume of domestic refrigerators sold reached more than $200,000,000.

I have just received sales figures for the first five months of the year. According to available data 380,000 refrigerators were sold between January 1 and May 31, 1933. This number, sold during the first five months of the present year, is half the number sold during the preceding twelve months. When we take into account the slow start made this year due to the bank holiday and late spring, the 1933 sales give remarkable proof of the growing buying power and increasing confidence of the public. Right now, many of the larger manufacturers of refrigerators are operating at full capacity, on a twenty-four hour basis, and production of some plants is six to eight weeks behind orders!

I can quote you astonishing and direct results in at least 100 cities, showing what has been accomplished in increasing sales of electric refrigerators through our local cooperative measures.

At the same time, there was developed a profitable betterment in harmony and mutual understanding between the central stations and other electric appliance dealers, and also among all electrical dealers, even in the cooperative selling of other appliances.

Financial journals and other trade publications have stated that the Electric Refrigeration Bureau activity has developed into one of the most far-reaching cooperative activities in the history of American business.

THE ELECTRIC COOKERY COUNCIL (1932-1933)

I shall simply mention the Electric Cookery Council in order to complete

my list of cooperative endeavors. You are to hear a complete report on this activity from its able Chairman, Mr. Preston S. Arkwright. I know he will show you that the progress made has well repaid the investment.

Let us now summarize these five cooperative campaigns:

First was the Home Lighting Contest,—non-commercial in scope, highly successful in accomplishing its educational aim.

Second was the Industrial Lighting Campaign, aimed to create sales. For $100,000 spent, it brought nearly $8,000,000 of new business, and more than $4,000,000 of new annual revenue to central stations.

Next in order is the National Food Preservation Council, a non-commercial activity, successful in its effort to create a public consciousness of the need of proper food preservation and adequate year-round refrigeration.

Then comes the Electric Refrigeration Bureau, aimed definitely and directly at increasing sales and increasing kilowatt-hour consumption. I have already told you that in 1931 alone the retail sales of domestic electric refrigerators amounted to over $200,000,000, and that the revenue to lighting and power companies was increased $27,000,000 annually.

Finally, there is the Electric Cookery Council, patterned to a certain extent on the Electric Refrigeration Bureau, and already achieving unusual recognition.

Here are five cooperative programs—with a perfect record of success. Not one has failed. This is an exceptional record.

Every one of our cooperative campaigns attempted to sell either a good article or a good idea to the public. In each case, we had a clear plan, fine organization, and the teamwork which carried the ball over the goal line.

We have seen that a non-commercial campaign with a constructive, educational object can be successful. I believe that the success of such a campaign depends upon the objective being of unqualified advantage to the public; upon its bearing a close relation to some commercial advantage; and upon the campaign being of brief duration.

On the other hand, a well and completely planned and organized cooperative campaign with a direct commercial purpose can be carried on over a long period, and its chance for success is strengthened by a long, continued effort.

As I look back now over our five coordinated campaigns, I perceive that we have been steadily approaching an unseen goal. As competition in electrical merchandise became more and more keen, we have turned toward *cooperation as a means of economical sales promotion*. And that, Ladies and Gentlemen, is the keynote.

Cooperative selling and advertising is not new. Many selling activities have been carried on nationally, with very fine results. Well known is the cooperative advertising and selling work of the Florists Association, and their slogan—"Say It With Flowers"; the campaign of the California Fruit Growers Association, which induced the American public to double its consumption of oranges; that of the Cement Association, which promoted the building of good roads.

I have always thought that cooperative undertakings can be successfully launched and carried on in the electric light and power industry. In a report that I made in 1927, as Chairman of the Commercial Section of the National Electric Light Association, I advocated a national coordinated sales program.

In my opinion, it is about time that we all recognized that coordinated action is one of our great assets, perhaps our most effective means for moving electrical goods. Isn't this perhaps as great a step forward in the economical *selling* of goods as was mass production in the *making* of goods?

Never was intensive effort more necessary than it is now. Our attention must be centered upon bringing back to normalcy the business of light and power companies by increasing our gross earnings, and this can be accomplished by carrying on an intensive cooperative selling campaign of electricity-consuming devices.

For the future success of coordinated campaigns, nothing seems to me more vital than the building of permanent and active local organizations. We are fortunate in having thousands of men already trained in such work—men of vision, men who have voluntarily served in the past because they sensed the new era in this cooperative development.

There are now 45 local electric leagues, associations, etc.; there are more than 450 local Electric Refrigeration Bureaus, and nearly a hundred local Cookery Councils—all a nucleus for the nation-wide cooperative organization which I am so sure will come into existence in the near future. If there were one thousand of these local organizations, the success of any sound, cooperative promotional plan could be assured.

It is high time that we planned for cooperative sales promotion on a basis of permanent national and local organization; on a basis which will enlist the eager support of the entire electrical fraternity; on a basis that will bring new prosperity to our entire industry, and a greater electrical era to the American public.

AMENDMENTS TO THE CONSTITUTION

That section of the original Constitution of the Edison Electric Institute which provided for individual members (officers or employees of member companies) was deleted from the Constitution by vote of the delegates at the recent convention and a new section providing for affiliate membership by Canadian companies was added at the same time.

Except for slight changes in phraseology in certain sections, the amendments to the Constitution, as adopted at the Convention, are as follows:

Article III—Section 1—Subdivision C—*which read* "Individual members who shall be officers or employees of Company members" *was deleted.*

Article III—Section 1—Subdivision C—*now reads* "Canadian affiliate members shall consist of the company members of the Canadian Electrical Association. The Canadian Electrical Association as an association shall pay the dues of the Canadian affiliate members in such aggregate amount as from time to time may be determined by the Board of Trustees."

Article III—Section 3—*which read* "Individual members shall be officers or employees of company members elected by the membership committee and continued from year to year upon the written approval of the company member with which such individuals are connected" *was deleted.*

Article III—Section 3—*now reads* "Officers and such employees of company members as are designated by an executive officer of a company member, shall be eligible to attend conventions and serve on committees of the Institute."

Article IV—Section 1—as amended *now reads* "The company members shall from time to time and not less than annually publish financial statements, including balance sheets and earnings statements, showing gross and net income, operating expenses and surplus accounts, which statements shall be certified to by independent firms of certified public accountants who shall have audited the books of the company."

Article VII—Section 1—as amended *now reads* "The officers of the Institute shall be a President, one or more Vice-Presidents, a Managing Director, a Treasurer and a Secretary, who shall be officers or employees of company members or full time employees of the Institute but need not be members of the Board of Trustees."

Article VII—Section 5—*which reads* "The Secretary shall perform the duties assigned to him by the Operating Committee," *was added to the Constitution.*

THE NATIONAL ELECTRIC COOKERY COUNCIL PROGRAM

BY PRESTON S. ARKWRIGHT

President, Georgia Power Company and Chairman, National Electric Cookery Council

Abstract of a talk before the Second Session of the First Annual Convention of the Edison Electric Institute

We started the National Electric Cookery Council about a year ago. In the early part of 1932 the range manufacturers became restive. They were hearing of the success of the refrigeration campaign. They knew that electric refrigerators had been perfected and sold in volume only five or six years. We had had electric ranges twenty-three years, but more refrigerators had been sold in a year than we sold of ranges in the whole twenty-three years. So the manufacturers became enthusiastic in the early part of 1932, and I became Chairman of your Cookery Program a little later.

We have had a great many difficulties in the past year. I am very sure that if at the beginning we had realized what the year held for us of trials and losses, and decreasing earnings and depressions beneath depressions, bank holidays, moratoria, and so forth, that we never would have undertaken the program. I spent most of my time at the meetings, when things looked the blackest, in persuading the range manufacturers we ought to go on with the program. If we had known before we started what the year held for us, we would not have undertaken it. And that would have been a mistake. We would have lost not only a year, but we would have lost our hopes of ever getting electric ranges and electric cookery promoted, within a definite term of years.

My company in Georgia started a campaign the first of May to sell $250,000 worth of refrigerators in sixty days. We have since doubled the quota. We have had employees this year selling small appliances, and in every single case they have exceeded the quota. Our output is growing week by week. Week before last we had the largest electrical output of any week in the history of the company, not excepting 1929. We are ready to go, and the Electric Cookery Council is ready to go, but it wouldn't have been if we hadn't started a year ago. Even the range manufacturers have been lukewarm, and now they are getting hot. And we can not put it over until they do get hot.

We haven't been idle. I don't know that I can say we have increased the sale of ranges very much, although more have been sold than we would have sold if we hadn't had the effort under way. Nevertheless, we have had a long way to go to organize, a long way to go to persuade the people in the industry itself that electric cookery is practical and is worth pushing. But we have started, we have an organization, an executive committee, a planning committee, an advertising council, we have sponsors and directors in all the eleven geographical divisions, we have a manager, we have three field men.

Do you know what those field men have been trying to do? *Sell the sellers* of ranges on the idea of electric cookery. That is all. We haven't had any money for promotion of sales and national advertising, and what money we have had we have spent selling the people in the business on the desirability of selling electric cookery and the practicability of electric cookery and the economy of electric cookery and the possibilities in electric cookery.

The field men have contacted practically the entire industry, all over the United States. They have established 93 local councils. There are 48 in the making, and there are 18 others who have cooperative efforts upon the same plans and policies of the National Electric Cookery Council. Those companies represent about 47 per cent of all the customers in the United States where there prevails a rate of three cents or less, and you cannot sell electric cooking in any volume at a higher rate than that.

When I first put electric lights in my house, I put in combination gas and electric fixtures. In the beginning I didn't believe in electric lights, and very few other people believed in them either. They all put in, originally, combination gas and electric lighting fixtures. Most of you are old enough to remember. They are a curiosity now. They are rare things. You can't find one anywhere. Nobody wants gas lighting when they can get electric lighting, or any other form of artificial lighting, even if it cost more—and it doesn't. I never had an electric range myself until my company started selling them in 1929. Previously I never had a gas range until my company bought the gas company either. I used wood and coke.

I have heard it stated here today that we are not going to build any more power plants for a number of years to come, and I don't think we are. We are not going to do it in my neck of the woods. The government is going to build all of them down there if they are built. We have more capacity now than the present business warrants. We cannot sell any securities at the price we should get for them. There is no particular construction to go on. I think the only thing left for all of us to do is to get out and sell the product. That is all there is left for us to do, *sell the product*.

Recently I asked my sales manager: "If you sell electric light and miscellaneous small appliances, and a refrigerator, and stop right there and don't sell any more, assuming that you don't sell quite everybody, what will the average domestic kilowatt-hour consumption be? What is the annual maximum possible to expect?" He said: "Seven or eight hundred kilowatt-hours."

I said: "Let's suppose it is an average of 1000 kilowatt-hours for lighting, small appliances, and a refrigerator. What is the lowest rate that average consumption would justify?" He said: "Four cents."

An average of four cents isn't low enough, but we cannot hope to go lower if we stop at the refrigerator. We have got to add the range. We must get the revenue from the increased consumption, to begin with. And we have got to do it in order to reduce the average kilowatt-hour price to the domestic consumer, and the only way we can do it is to increase the consumption, and everybody knows that. The range itself will add something like 1500 as a minimum, on up, per annum. And it opens the gate to what is needed.

A refrigerator isn't going to sell a hot water heater, and nobody is going to put in a hot water heater because he has bought a refrigerator. They won't in my town. They won't run a gas stove and put in an electric hot water heater. So if you want to sell electric water heaters, you have to sell ranges before they will consider water heaters.

Maybe the day will come when we will have home air conditioning. I hope it does. Who is interested in cooling the

air in the home with a coal range in the kitchen, or a wood range, heating up the whole house, and then spending money to cool it? We have to sell electric ranges in the home as a step toward selling home cooling.

I don't want to argue here about the advantages of electric cooking, but I do want to say that the same fundamental reasons that make electric light the best artificial illumination, and that make electric power the best application of power, likewise make electric heat, excepting those chemical cases where you require oxidation, the best application of heat, that is heat without combustion, heat without flame, heat easily controlled, heat capable of automatic operation, heat directly applied where you want it and not wasted all over the premises. Those same fundamental reasons that apply to electric power and electric light, that sell the other uses, apply to electric cooking too, and any good Home Service demonstrator in your company can prove it to you. There is no question as to the desirability of this cooking service you are trying to sell, and certainly there can be no dispute of a *need* to sell it. We *need* more revenue in this business, *and we need in this business lower rates brought about by increased use.*

Selling the electric range is no harder than selling electric refrigerators. The range costs less than the refrigerator, to begin with. Mr. Davidson told you that the public had to be sold on the idea of the desirability of the refrigeration in the household before you could sell the product—electric refrigerators—in volume. The public is sold on the idea of cooking, so we don't have to meet that obstacle. The Refrigeration Bureau had all sorts of competition with ice, and the utility did not want to offend its ice customers.

The electric range ought to be easier to sell than a refrigerator. It produces three times as much revenue from kilowatt-hours used, and it opens up additional opportunities for revenue in the home. If you have an electric range you open the opportunity for a water heater. The cost is less to the customer, it fills a more necessary purpose, brings more comfort and convenience and happiness and leisure, and brings to the company more revenue and use for its facilities.

One objection raised is the cost of wiring for the range, varying from $14 to $80, an average of $34, and we hesitate to sell the range because we have to put in $34 worth of wiring. What is this business anyhow? It is furnishing facilities for the customer's use, making an investment to provide for facilities for the customer's use. What difference does it make whether the facilities are in the power house or in the customer's house? I sometimes wish we owned all the wiring and all the appliances in the customer's house. The telephone company does it. I tell you, if we did own all the wiring and all the appliances in the customer's house it would be lots harder for somebody else to come and take the business away. I don't know that it is practical. I merely suggest it. I think it would be a very good idea. I don't see any obstacle in the fact that we have to provide wiring for the range. We would own it. If the costumer goes some place else we could take it out or leave it for the next tenant. All right. If you put a line on the street and the municipality takes away the company, the line on the street is junk too.

Another objection raised is that if you sell a range you have to spend $150. strengthening the distribution system. Now in my company we allow $150. for the distribution system for every range sale, and in many towns they have already rebuilt the entire distribution system as a result. I don't believe that, in general, the increment cost for a range will approach this figure.

We want to keep up this promotional effort on electric cookery until we get all the electric light and power companies interested. Please don't understand that we can make a success of it if only electric light and power companies sell ranges. We cannot. And there wouldn't have been a success made of the refrigeration campaign if only central station companies sold refrigerators. We have got to increase the outlets, the dealer sales outlets, the distribution agencies for it. That is where I quarrel a little with the manufacturers. They all want the best local selling agency. The central station is the best selling agency. Therefore they all compete for the central station business, but we cannot sell the products of all range manufacturers. We cannot get selling agencies for them. We cannot put this sales program over unless the central station companies father it in the local community and underwrite the promotion of it. It cannot be done in any other way. So we are going to keep after it. And we want the chief utility executives to get interested.

Sometimes a manufacturer holds back in spending much time and money because he says that when he promotes electric cookery a lot of other people will begin to make ranges who do not contribute to the effort. They save the money which would be contributed to the range program and knock off two or three dollars of the sales price and the customer buys the competing range because it is that much cheaper.

I think we ought to recognize those manufacturers who help to promote the national effort. The more they make the more we sell, and the more each of them is going to sell.

I want to say I firmly believe and wholeheartedly believe in the desirability and practicability of electric cookery in the home, but it can only be put over by the wholehearted support of the industry. Criticisms, objections, indifference, reluctance, timidity, doubts, questionings, laziness, lethargy, never put over anything and won't put this over, either.

I had a friend once who said he lived on a plantation before the war, and whenever the rain came up the creek swelled and washed away the fences and the cattle got into his crops. His father went out after a high rain and mended his fences, and he went with him and his little negro playmate went along. The old man got down there and found the water was still rushing down the creek, and he just stood and looked at it, and kept on standing and looking at it. The little negro said to him, "Boss, nobody nevah got nowhere by jus' standin' and dreadin'." And that is what I think we cannot put up with in this campaign or any other campaign. It is going to take wholehearted enthusiastic support of all interests now and continuously hereafter. We will find a way around all criticisms and objections.

OPERATING COMMITTEE MEETING

(Continued from page 54)

recommendation from the Accounting Committee that that committee should confer with the similar committee of the American Gas Association for the purpose of obtaining agreement on accounting principles in the electrical and gas classifications of accounts. The Chairman of the Accounting Committee reported that some few points of difference called for adjustment. When such agreement has been obtained, the Chairman of the Accounting Committee was instructed to submit the revised classification to the Committee on Statistics and Accounts of the National Association of Railroad and Utilities Commissioners.

COMMERCIALISM AND COMPETITION—TODAY AND TOMORROW

By GEORGE E. WHITWELL
Vice-President in Charge of Sales, Philadelphia Electric Company

An address before the Third Session of the 1st Annual Convention of the Edison Electric Institute, Chicago, Ill., June 7, 1933

"Selling a Sales Program" might well have been a title for all of that which you have seen and heard since Mr. Davidson's presentation yesterday of his admirable paper. Frankly, our object has been to resell each of you or to keep you sold on the selling end of the utility business, stressing opportunity, methods and a few of the specific utilizations of electricity that are all but crying out for planned industry selling programs.

In this attempt to sell you on a vigorous sales effort in each of your companies and in each of the cities, towns, villages and even isolated farms served by you, we have patterned our presentation along the lines that anyone of us who claims to be a sales manager might have followed in a sales meeting with his own salesmen. We have given you variety—so that from the whole, you can surely select something that fits your particular problem. We have used visual demonstration in two forms; the one, pantomime, centuries old but always effective, the other, a playlet. We have used humor lest we take ourselves too seriously, and, fearing the magnitude of a task, make little or no attempt to get it done.

We hope you have liked it. We hope we have sold you the selling of kilowatthours as an industry job that merits your future support through vigorous action and the wise expenditure of real money. We hope that we have pointed a way in connection with a few specific opportunities, which have been selected for presentation here not necessarily because they offer the greatest opportunities or deal with the most important problems, but rather because they are typical, are both relatively new and as old as the industry itself and come, all of them, within the scope of any utility, large or small, no matter where situated.

Some may criticize the program because it contained little in connection with power sales and the problems of the power salesman. His has not been an easy path during the last few years. Even where he has sold volume new business, he has become unutterably discouraged due to the falling off in use, by customers, of the total load connected.

The power salesman and you and I have had to meet the blazing searchlight of inquiry into our power rates, their application and their justice. We have had to withstand the charge of lack of sympathy with the conditions facing our customers. Sometimes we have had to meet more bitter, even acrimonious or vindictive criticism. We have had to deal frequently with a customer who, having seen all but the last of his business and his net worth swept away, stood on the brink of disaster and, in the frame of mind of men in such a situation, had to be sold on the stability, the honesty of purpose, the integrity of operation, and the value that, by and large, exists in the electric utility business and its personnel throughout this entire country. We have had to meet the competition offered by today's low commodity prices.

From it all has emerged the one thing with which a business or an individual possessing it can never be completely downed. That one thing is *character*. Recalling the time when a money-mad world gaged its industries, its utilities, its people, by a yardstick composed solely of earnings, or of values of securities, or of possessions, I think that now all of these things have been relegated to second place. The first yardstick today for the measurement of an industry, a utility or an individual has become character, with all of the homely virtues included in the scope of that word.

With character, with honesty of purpose, with confidence of value received by those who purchase our product, and with an abiding faith in the inherent financial stability of our industry as a whole, our salesmen, mindful of the scars received during the past few years and of the lessons learned, are looking forward, not behind, and are deserving of your complete support. With your confident backing, the salesman can intelligently meet competition. Then, revenues will be increased. The sales price per unit will be decreased. Means will be provided thus to offset whatever inroads are otherwise being made into revenues and to provide revenue for whatever added expenses may be placed upon us. Without your enthusiastic and substantial support of your company's sales program, little remains to combat those forces—whether they be taxation, restrictive legislation or what not—that, with sales and increased revenue, can and must and will be met and overcome.

Among your salesmen is the power salesman. And what are his problems? You may classify them in some other way, but I give them to you under three general headings:

First—The problem of meeting competition in the sale of new business.
Second—The problem of retaining business which we now have.
Third—The problem of stimulating the market so as to replace sections of that market which have been saturated by past sales efforts.

To get more business, to hold that which we have, to open up new fields and new uses so that we have an ever-expanding potential use for electricity—are not these the problems confronting the power salesman?

The first two of these are of immediate and pressing importance, because of the effect of present-day commodity prices and labor costs on the investment necessary to install isolated plants of all kinds, and the effect, today, of the reduction in labor costs and in commodity prices on the operating costs of these same plants. The cumulative effect of reduced fixed charges and operating costs have been such as to create what is often a wide spread between the fixed rate structure of central stations and the cost of privately generated power.

Since the largest single item of expense in the cost of central station energy results from past investments at higher prices, it will be impossible to take care of this spread by immediate drastic rate reductions without setting up a tariff lower than the cost of production. Also, since the effect of re-

duced commodity prices can only be realized in our tariff as existing equipment is replaced by new equipment at the lower price, it is always a number of years before the full effect of reduced investment costs can be reflected in our rate structure. These facts compare with the almost immediate drop in our competitors' prices. The severity of this condition will, of course, be modified by any increase in kilowatt-hour delivery due to improved business conditions and it will be aided by any sound and permanent reasonable increase in commodity prices.

It would appear that, under these conditions, the loss of a relatively small amount of business is inevitable. Instead of worrying too much about this let us rather use our energy in keeping it to a minimum by several methods:

First—By making use of the natural hesitancy and frequent inability of customers to make investments at a time when liquid capital is needed to help tide the business over a depression period. This, naturally, makes the customer lend a receptive ear to short amortization periods, as his capital is worth more to him as a means of insuring the continuance of the life of the business than it is fixed in machinery to produce power.

Second—By impressing upon the customer the need for using conservative fuel, material and labor charges over this short amortization period so as to insure the return of his capital over the selected interval of time.

Third—By developing all the possibilities inherent in the establishment of off-peak rates, both seasonal and daily. This method is effective in several ways:

One, it offers the customer a reduction in cost and spreads a relatively low loss of revenue over a very large number of customers because everyone can take advantage of it who can afford to rearrange his operations.

Two, it has an appeal to the customer in that it offers him something which places the amount of his savings under his control.

Three, it gives the salesman an added talking point in selling new business.

Four, it introduces a personal incentive on the part of the customer to improve his operation from the central station viewpoint, so that the overall effect of the continued pressure of this personal incentive should, over a period of years, result in a decided improvement in the shape of the industrial load curve.

Five, in so far as the central station is concerned, this method of price change has, in addition to the foregoing advantages, the further attraction that it does not interfere with the basic rate structure. If some of the effect of improvement in the industrial load curve becomes apparent before basic rate reductions are forced by the need to meet the market, there may be a sufficient reduction in overall utility costs, due to this improved industrial load curve, to permit, without loss, a certain amount of basic rate reduction.

So much for new load obtained in competition and for holding existing business. Sane thinking, confidence, knowledge, these tools the salesman has.

The third problem of the power salesman, namely the development of new applications of electricity, naturally looks toward the general future development of the industrial business of the central station and offers considerable difficulty on account of the relatively limited sales expense possible due to the low unit cost of our product as contrasted with the great number of individual prospects in the market. It is possible that the answer to this problem is the cooperative sales campaign which requires that each branch of the entire industry does that which it can do best and most economically, thus eliminating duplication of effort. The value of coordinated effort is based upon the following two facts:

First—That the sale of our product for power is dependent upon the sale by someone else to the customer of utilization equipment, and

Second—That the central station should know the market and its needs better than anyone else who is interested in that market.

With these two thoughts in mind the cooperative sales campaign naturally takes the following form:

One, an advertising campaign in which the utility and interested manufacturers, contractors or distributors, cooperate on an equal division of expense basis.

Two, this advertising campaign to be developed by the utility, with the approval of the cooperating agencies, in order to sell the idea of the particular application to the selected market. This advertising matter should not urge the sale of any particular make of equipment.

Three, the selection of the proper list of customers to be attacked in this campaign.

Four, the follow-up of the advertising by the utility's salesmen in the attempt to eliminate the immediate from the deferred prospects.

Five, follow-up of the immediate prospect list by the salesmen of the cooperating agencies so that the utilization equipment is sold.

This plan answers the problem of man-power and coordinates the industry job in a way which, generally, has not been followed before. It permits the timing of the attack and facilitates a planned annual drive on each phase of the market until saturation is reached, when the entire cooperative organization can be directed in the same manner at another phase of the market. It eliminates the missionary work by the manufacturer and gives him a list of real prospects on which to concentrate his selling.

It is highly important that we adopt this or some other equally practical method of maintaining at a high level the volume of new business under negotiation, not only on account of the need for stimulating sales but also on account of the fact that the isolated plant market is rapidly approaching saturation, so that some way of replacing this nearly sold-out phase of our market must be found.

It is obvious that the only way in which volume can be maintained in the face of the saturation of the isolated plant field is by adopting some plan which will increase the number of kilowatt-hours per man in industry. In other words, new applications must be sold to existing customers in increasing volume. The method just proposed is applicable in any field of industry, whether it be air-conditioning; industrial heating applications, large and small; lighting; commercial cooking or whatever, for you, offers the quickest immediate results. It puts merchandising methods into power and light selling. It will meet a lot of the competition you are worrying about.

Turning from the problem of industrial power, you may have thought our program here should have had more to do with the domestic customer or with appliance selling. Our program has described to you certain outstanding coordinated national selling campaigns which have been uniformly successful. It has called your attention specifically to the range and to the refrigerator. In connection with the latter, using it purely as a medium, we depicted for you, in a playlet, one phase of appliance selling, at parts of which perhaps you laughed, but in connection with which we hope that, in the future, you will recall some of the homely basic truths that most of us, as human beings, doubtless forget too often each day.

The appliance problem in the domestic market is the distribution of equipment and its continuing use by customers. It is just as simple as that. Most of us try to make it a great deal more difficult.

Most of us are so set in our opinions that our way of accomplishing this objective is the only right way, that we overlook a tremendous number of bets inherent in the other fellow's way were we only sensible enough to adopt them. The question is not fundamentally, as I see it, whether a utility should merchandise or whether it should not; whether a city should have an Electric League or whether it should have some other sort of association industry group; whether there should be a district representative plan or whether specialty salesmen should be employed. The fundamental problem is the maximum distribution of appliances on some basis.

best suited for a particular locality or group of localities, on which the manufacturer, the jobber, the contractor-dealer, the department store, the hardware store, all other retail outlets, and the utility, each does that which it is best fitted to do. On such a basis each is permitted—granted reasonable business ability—to make a profit and each sees to it that he knows his market and has provided ample coverage so that his particular products constantly forge ahead.

Having obtained infinitely better and more intelligent distribution of appliances than we have so far obtained, the entire industry has an interest in having them continually used—the utility because it exists only through sales of its service, the other agencies because each successfully used appliance brings a desire for other appliances and, ultimately, replacement sales.

Time is too short to go into the subject of the domestic appliance market at great length, but I can point out a few things that, it seems to me, we can never afford to lose sight of in getting distribution and use of appliances:

First—The ultimate consumer is not yet sold with real desire for more than a fraction of the electrical appliances he could use to his own advantage and to his own greater comfort in creating for himself an easier, better, simpler life. While you have all heard it many times before, I am going to repeat that the electrical industry has a big promotional job ahead of it—a job that must be coordinated nationally and locally.

Second—The completely successful financing of sales of appliances is as yet an unsolved problem. Many methods have been tried; some have been good, some bad. Recently there have been some new developments, but, by and large, the electric utility has a great interest in obtaining the best solution in its territory to the problem of how to finance the distribution of electrical appliances.

Third—There is much to be done in developing standards of construction and performance of appliances. It must be confusing to any layman when he attempts to reconcile the relatively large divergence in prices and performance which he observes as he shops around for almost any appliance. The utility has had since the beginning of the electrical industry, and still has—perhaps in some respects to an even greater degree—the responsibility of protecting the consumer against inferior merchandise and encouraging quality construction by manufacturers.

Fourth—All industries need better and higher-type, and perhaps better compensated, salesmen. The electric utility business is no exception. There is a training job to be done if the salesman is to be able to produce maximum personal business, do the best possible industry job, and keep appliances in use and create desire for additional equipment.

Fifth—There must be new ways constantly created for getting customers' attention and creating interest. Yesterday's brilliant idea is moth-eaten today. There must be continually better advertising, more of it, and new sales appeals.

Finally—In keeping appliances in use, it seems to me that the future should see more attention paid to this phase of our domestic revenue problem. Mr. Skinner this morning gave interesting results of a very illuminating survey. You know as well as I that selling the appliance does not necessarily automatically provide for the sale of domestic kilowatt-hours. You know it so well that I am almost ashamed to repeat it. I say it because very few of us, if any, have ever developed an adequate selling program for assuring continuing use of appliances. Today, perhaps, this job is more important than ever before.

To sum up the residence situation, briefly and perhaps inadequately, appliances have not sold recently as we would have wished and compulsory economy has put many an appliance on the shelf and has reduced the wattage of many a light bulb. We do not have any longer, in most instances, the excuse that we cannot sell any more appliances or light in this or that particular location until we get more wiring. In many such locations there is in existence today as much wiring as there was, let us say, three years ago when light bulbs of perhaps twice the wattage and appliances in greater number were being used successfully, with plenty of wire to get the current to them adequately. Not that there still is not a wiring problem, I do not mean that—there certainly is. Rather am I trying to say that this problem is non-existent in many homes today in so far as re-obtaining, up to the extent of last year's use, of a very large number of kilowatt-hours of domestic consumption. Very few of our sales plans provide for quickly re-selling this immediate market. I earnestly urge that you put your support and money back of this job.

With this sketchy resume of the domestic field, let us turn for a brief glance at something else. Perhaps your immediate interest is concerned neither with the industrial customer, nor the residence customer, nor lighting as presented and discussed here this morning, nor air-conditioning, nor ranges, nor refrigeration. Perhaps your major problem is the so-called small commercial customer or the rural customer—neither of which classes of business have as yet been specifically referred to.

I think it is true that, in approaching the problem of selling the smaller commercial customer, one encounters the possibility of the sale and use of an almost infinite variety of equipment. The problem, due to the large number of customers in this group, is originally one of selection rather than a helter-skelter attempt to cover the complete field. It seems to me that it requires the application of the same old principles:

First, what part of the market is easiest and cheapest to sell? I am sure that you still have plenty of such market in your territory, wherever it is.

Second, how can we best approach our market under existing local conditions, whatever they may be?

Third, what special sales activities must we use in planning and carrying out this method of approach?

The rural problem is perhaps a little bit more complicated because of special conditions surrounding it and often because of rather heavy investments involved. After all, however, it requires only knowledge, courage, intelligent planning and a lot of hard work to get this business.

We are all rather queer people, we salesmen. We seem to thrive best on campaigns and on specialized effort carried out enthusiastically over relatively short periods of time. It is very difficult for us, and, when you are enlisted to help us in all-employee selling campaigns, it is difficult for you also, to continuously and enthusiastically, steadily and consistently, go forward, except over short periods during which there are some special incentives. Mr. Davidson mentioned the splendid results that can be obtained when there are planned campaigns. Perhaps they are the best tools in the salesman's kit. Let us be sure that we use them.

For example, would it not be a marvelous thing for the electrical industry as a whole if, next fall, every electric utility in the United States, for a period of four, six or eight weeks, would intelligently campaign the sale of light? Everybody has been economizing on the use of light in the home, in the office, or store, in the factory, on the farm, even in connection with signs. It is not an automatic use of electricity—it is entirely controlled by human operation of a switch. When economic pressure comes it is a very easy thing to remember to turn off the light. True, eyesight suffers; sometimes health suffers; often money that might have been spent for light is spent for something else that does not bring to the user a fraction of the convenience and comfort that light provides. But light has been used with too great economy, our income has reflected this condition and we are not happy about it.

Is there any one thing that the utility industry could do as a whole that would bring back revenue more quickly than, over a sustained period, to resell the entire general public the value of the use of light? The American people, today as always, will spend money to obtain value. Forced economy has made millions of people forget the value of light. Why not a national selling campaign on light next fall—each utility doing its own job in its own territory, in whatever is the best way in that territory; every utility employee in the United States, regardless of his depart-

(Continued on page 92)

SOME PHASES OF THE FEDERAL TRADE INVESTIGATION

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An address before the Fourth Session of the 1st Annual Convention of the Edison Electric Institute, Chicago, Illinois, June 8, 1933

An important fact in the electric utility industry today is government—regulation by the government and investigation by the government. The states fix our property values, they prescribe our accounting systems, tell us how much we may earn and prescribe rate schedules to bring about such an income. The federal government licenses our water powers and proceeds to regulate their operations wherever the blanket of state regulation leaves a spot uncovered. Special Congressional committees inquire into all our activities, the work of one often overlapping that of another. But extending over it all is the investigation by the Federal Trade Commission, now well into its sixth year of continuous research. Government conferences and hearings have become a part of the routine of every large utility executive. The governmental questionnaire finds its place alongside of each company's ledgers.

A certain Chinaman found an easy way to solve the questionnaire problem. Dr. Francis Walker, Chief Economist of the Federal Trade Commission, tells about a Chinaman who received one of the Commission's questionnaires in connection with an investigation of laundries. The Chinaman, however, with the wisdom of his race, did not answer it. The Commission sent a second questionnaire, with the customary demand that it be answered. The Chinaman returned the second questionnaire and letter and enclosed a five dollar bill. Thereupon the Commission wrote the Chinaman, returning his five dollars, and sought, with its usual persistency, to get an answer to its questionnaire. In due course the postal authorities returned the Commission's letter and on its envelope there was inscribed — "Mr. Ching moved. Address unknown." The electric utilities have not been as fortunate with their questionnaires as the Chinaman, who incidentally revealed a new method by which to balance the budget, the possibilities of which remain as yet untouched.

The Federal Trade Commission has conducted since its organization over 73 investigations, ranging from an investigation of peanut prices to the method of sale of farm machinery. According to the Commission's report, the costs of such investigations have ranged from nothing to $1,598,677.13, the latter figure being the cost to the government of the Walsh utility investigation. The investigations included that of the General Electric Company under Senate Resolution 317, adopted January 27, 1925. In its report under that resolution the Commission found that there was no violation of the anti-trust law and likewise found that there was no power trust.

The present utility investigation commenced in 1928. At that time the whole country was prosperous, and industry was flourishing. The legend of great wealth prevailed; riches were thought to be easily acquired. The legend carried the story that some men in the industry were amassing great wealth, and the implication was that they were doing so by means of alleged manipulations. It was also charged that a few men by virtue of their wealth and position were the owners of the industry throughout the country.

In contrast, we see today the disastrous results of speculative fever, vanished paper profits, the then wealthy made poor, and companies once prosperous now barely earning sufficient to pay fixed charges. The ownership of these companies is more widely held than ever before, extending to all classes of people throughout the entire United States.

In these days of excessive taxation, superabundant and conflicting regulation, reduced rates and costly inquisitions, we are confronted with the reverse of the conditions imagined to have existed at the time this investigation was inaugurated. Few realize that since 1924 domestic electric rates throughout the country have been reduced approximately 25 per cent, and this reduction, with the tremendous loss of business, finds us in about the same plight as American industry, generally, today. The scope of the investigation is defined by the Commission as follows:

"As to the scope of the topics of inquiry, it is apparent that in discussing the growth of capital assets and liabilities, this Commission has to do with such facts as they are *generally understood in business dealings*, namely, the growth of such assets and liabilities *as they appear on the books of account*, together with any information regarding the accuracy and propriety of such records as may be obtainable * * *. The Commission recognizes that the fair value of assets and liabilities *may be much greater than the books of account disclose or that they may be less* * * *. It will also be impossible for this Commission to make findings as to the reasonableness of the rates of return on fair value of the property of these utilities because such fair value is not determined in this inquiry, as already stated. It also follows as a necessary consequence that the reasonableness of specific rates for service charged by operating companies is therefore not here in consideration."

The investigation has been divided by the Commission into two phases; the so-called propaganda or publicity phase and the accounting phase. With the limited time at my command, I will confine myself to the accounting phase and dwell upon but two or three major subjects, although much could be said on the publicity phase.

The accounting investigation relates to the examination of the business transactions recorded in the books and records of the companies. Engineering and various statistical reports are also made. The investigation is critical and exhaustive. It construes and interprets the transactions as recorded in the books without relation to practical business methods of the period or economic conditions existing at the time of the recording of the entries in the books.

In many instances the criticisms made, which would be valid when applied to the private, unregulated company, lose their force completely when we consider that this industry is a highly regulated one whose growth and expansion has been largely had under legal, accounting and engineering supervision of diligent state commissions throughout the country. The investigation is devoid of the romance and drama which have characterized the progress of the industry from the localized urban community to great interconnected systems affording metropolitan service in the remotest hamlet. It gives little recognition to the hazards, difficulties and obstacles encountered in the financing and construction phases of the business. It lacks that sympathetic understanding so well expressed by the Tennessee philosopher,

Gus Dyer, who in a recent speech, speaking of the cabin in the mountains of Tennessee, said:

"This revolution (speaking of the electric revolution) has brought that little wire into the country home and it has furnished hot and cold water, it has furnished all the luxuries and conveniences that come from hot and cold water, and then in another corner of the room it cooks the dinner, and while it's cooking the dinner in one corner, it's freezing the ice cream in the other, and singing you a song in the other corner. All that means that all modern luxuries and conveniences that belonged to the city exclusively are now carried to the country."

The investigation, nevertheless, has been thorough and painstaking. It has placed our industry before the mirror of public opinion. The mirror has, unfortunately, reflected more of the bad than of the good, because in the image that was held up to the mirror the bad was emphasized while the good was accepted as a matter of course and passed over without comment. The investigation has proceeded as a detailed scrutiny of every act and ofttimes upon the premise that if an opportunity to do wrong was presented that it has been availed of and that that wrong has been done. This, however, does not square with the true facts, nor are all of the acts as bad as the Commission's reports appear to indicate. This is a large industry. There are many groups and many companies. The many good are being blamed for the wrongs of the few. To blame the whole industry for the wrongs of the few is akin to blaming the legal profession, the ministry or the medical profession as a whole for the errors of judgment or wrong deeds of the individual lawyer, minister or doctor.

I have taken the topics which seem to have occasioned the greatest amount of criticism. I desire to devote a few minutes to the questions of write-ups, "rates of return," and mutiplicity of companies. I believe you will agree that these three are the most important for our present consideration.

Appreciation or So-Called Write-Ups on the Books

The Commission has assiduously pursued this subject with the companies examined, notwithstanding the fact that the subject of valuation is entirely excluded from the Senate Resolution under which the Commission is directed to proceed with the investigation. An avid press has seized upon these items and emblazoned them across its pages, causing misapprehension and alarm to countless investors in securities and to stockholders of the companies. The Commission's theory is that cost figures entered upon a company's books, irrespective of time or circumstance, are sacrosanct and eternal, notwithstanding the varying economic conditions inexorably affecting values of every character of property.

The Supreme Court of the United States in Los Angeles Gas & Electric Corporation vs. Railroad Commission of California decided last month, quoting approvingly from a prior decision (Minnesota Rate Cases, 230 U. S. 352, 434) concerning value, says the judicial ascertainment of value—"is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts."

Every corporation engaged in the public utility business is incorporated under state laws. An examination of the statutes of several states shows a great similarity in the provisions for evaluating the assets acquired by a corporation, although the provisions are not uniform.

All these states place the duty upon the directors of determining the value of the assets against which securities may issue. They may direct the issue of securities for cash, labor, services, property, both tangible and intangible. They must act in good faith in evaluating the species of property enumerated against which securities are to issue. The only restriction upon the directors is that they must act honestly, fairly and without fraud. In some states their courts hold that when the directors have thus fixed the value in good faith, the subsequent judgment of the court or jury as to the value of the property cannot be substituted for the good faith so exercised.

As to the operating companies, the courts have held that the regulatory commissions are empowered to investigate, hold hearings and cause an appraisal of the property to be made to aid it in arriving at a result so that by the plain terms of the statute the regulatory commission is given authority to fix the amount of capital stock which shall be issued in payment for property acquired by the utility.

In the language of the New York Court, which is a clear statement of the law of the land, it must be *as of the time of the organization*, and in that case the court said:

"The valuation shall be made as of the time and is not to be judged by the subsequent success or failure of the investment, and the property is properly valued at what it is properly worth however much its value may exceed what it cost the investor, for the cost is not the test of value, all elements of value or expenditure which have entered into the property or have been avoided by the corporation being properly considered. Accordingly, one who at an economy of cost and by the expenditure of skill and judgment had constructed a plant of suitable nature to be used by the corporation may sell it to the corporation for stock representing the actual value, including therein interest and fair profit on work of that nature."

This was a utility case. And in the same case, the Court said:

"While the expression 'market value' is sometimes used in this connection, that is not an accurate or correct test, at least where the property may have a real value in excess of the price it would bring on the market. Such a case is illustrated by the taking of an old corporation and its properties into a new one * * *. Consolidation of plants impart into the whole a greater value than the cost of the components provided that no mere fictional value can be thus introduced * * *.

The Federal Trade Commission determines from a pure accounting standpoint that the amount of appreciation or so-called write-up consists of (1) excess value over cost, (2) value reflected by physical appraisal where such appraisal is in excess of cost, (3) excess of value of consolidated company over book value of component companies, (4) any value reflected upon the books of the company no matter upon what it is based if it is actually in excess of the cash cost as reflected by earlier books or cost of a predecessor company.

The Commission, by attempting to strike appreciation or so-called write-ups from the books of the company, substitutes its judgment concerning the value of the property for that fixed by the Board of Directors of the several companies acting within their legal duty and moral right to reflect such values upon the books of the companies. It prefers books of account to United States Supreme Court Decisions, State Supreme Courts, State laws, the judgment of state regulatory bodies and Boards of Directors. In the main, the write-ups found by the Commission were the reflection of the honest judgment of the Board of Directors and based on facts to support that judgment. In a few instances, however, I must state that there have been what appear to be excessive valuations, for which I attempt no justification, because they were not made according to the law of the land. The defense of the principle of "fair value" for utility property does not require that I approve those valuations not made pursuant to established law and not supported by facts.

Of the amount of the so-called write-ups recorded by the Commission, much has already been written down. Based

upon the investigation to September, 1932, you would, no doubt, be surprised to know that the total net write-up as of that date is approximately only 5 per cent of the total investment. It would be my opinion that the total write-up in the industry as a whole, if all the companies in it were examined, would not greatly exceed a write-up of 5 per cent of the total investment in the company. I challenge any business, regulated or unregulated, public or private, to present a record equal to it. It is particularly gratifying to be able to tell you that the figure is but 5 per cent when you realize that the period of expansion in which these write-ups occurred was a period of unprecedented inflation. But in order to better appreciate that figure and its true meaning, I would like to call your attention to a few figures for comparative purposes:

Value of Farm Land in Iowa:

In 1910....	$2,801,974,000.	per acre $ 82.58
In 1920....	6,679,021,000.	per acre 199.52
Increase ..	$3,877,047,000 or 189 per cent	$116.94 or 142 per cent

(Source: Bureau of the Census, Statistical Abstract of the U. S. 1932, pages 574 and 577)

Value of New York City Real Estate (Borough of Manhattan):

In 1912.....$5,035,485,413
In 1922..... 6,058,643,144
Increase 20% over 1912
In 1932.....10,154,576,653
Increase 104% over 1912

(Source: New York Dept. of Taxes and Assessments.)

Cost of Federal Government:

In 1913.....$ 692,000,000
In 1923..... 3,885,000,000
Increase 460% over 1912
In 1932..... 5,007,000,000
Increase 1186% over 1912

(Source: National Industrial Conference Board.)

Wages:

In 1913.. Index 100.
In 1923.. Index 217. Increase 117% over 1913
In 1932.. Index 197. Increase 97% over 1913

(Source U. S. Bureau of Labor Statistics and National Industrial Conference Board.)

In other words, while the investigation has shown a net book appreciation of 5 per cent in the electric light and power industry there was an actual appreciation in farm lands of Iowa of 139 per cent; in New York Real Estate of 104 per cent; in cost of Government of 1186 per cent; in wages of 97 per cent.

Bearing in mind that this investigation does not deal with economic conditions of the country as a whole, nor these companies in particular, it might not be amiss to reflect for a moment on what the country was doing in an electrical way since the year 1924. Seven million additional homes were connected to the utility lines. One million new stores, offices and small factories were established. The farmers benefit in the use of electricity increased six-fold. Hundreds of small communities which formerly had only limited electric current during part of the day or no electricity at all were given the same service as that enjoyed by the large cities. Factories no longer hesitated about locating when they needed electric service. The uniformity of electric service was so thoroughly established that with only minor exceptions, one could move from Maine to Florida or from New Jersey to California and be assured that practically every electrical appliance could be used in the new location. By the establishment of interconnection of systems, combined with the diversification of the sources of power, interruptions and failures of current practically ceased, and yet while this increase in the use of electricity was continued and the companies were functioning to their utmost, we find that in 1924 the price of electricity to the average domestic user was 7.2 cents per kilowatt-hour. In 1932 it had declined to 5.6 cents, or by nearly 25 per cent. While the write-ups were going up, the rates were coming down. The net write-ups equal 5 per cent and the net average reduction in domestic rates since 1924 was approximately 25 per cent. This should be conclusive proof that write-ups do not increase rates to consumers.

These accomplishments were not obtained without labor. Isn't the public entitled to know whether the laborers were worthy of their hire?

I cannot pass this subject without reference to two instances brought out by the Commission which caused unfavorable public comment. In one, a write-up of many millions occurred. The Board of Directors took the stock of the new corporation upon its books as an investment and recorded the value of such stock at a value considerably less than the then market value but more than its cost. This so-called write-up has now been written down, but the publicity given the original write-up still rolls on.

The other instance was where one group merged several companies into a holding company. A value was placed upon the securities of the underlying companies in excess of the book value reflected in the books of such underlying companies. The stocks so recorded were placed in the treasury of the holding company and held there but were never sold or delivered to the public. This alleged write-up has also in substantial measure been written down again.

These illustrations are typical of many cases of write-downs where actual market values have decreased. Similar instances could be cited at length, but time goes on.

"Rates of Return"

Another subject meriting comment is one that has caused considerable injury to the companies throughout the country. The Commission from its book study, has learned the cost of the equity stocks of operating companies. It has also learned what those stocks earned. Obviously, the smaller the equity, the greater the earnings, and the larger the equity, the lower the earnings. The Commission has applied earnings against equities with some very extravagant conclusions. "Fair rate of return" has a well-known, well-defined and well-established meaning. It is the rate of return fixed by law upon the property used and useful devoted to public service and which rate is deemed necessary to attract capital. It is not a rate of dividend, it is not earnings divided by capital stock.

The Commission, by its method of computing rates of return, has caused great confusion and done great harm and injury to the companies in the minds of vast numbers of people throughout the country. The Commission has construed the Senate Resolution, under which it is acting, to mean that the rate of return is pertinent to the inquiry. The injustice of this construction is apparent. I recall one instance where the Commission found a rate of return of 2000 per cent. The reason that this rate was so fantastically high was because of the small capitalization of the company and the smallness or nominal amount of the equity in such small capitalization. No consideration whatever was given to the fair present value of that equity. The true, fair rate of return fixed according to legal principles would doubtlessly have been between 7 and 8 per cent. Again, this is the result of the character of investigation being conducted; viz., a book investigation alone.

Multiplicity of Companies

The investigation has emphasized the fact, previously well-known to regulatory bodies and appreciated by utility executives, that often there was the parent company, several sub-companies and several affiliated and often inactive companies. The Commission infers that there are too many companies in the family tree and intimates that many of

such corporations are unnecessary and may have been organized for extra-profit purposes. In very few instances does the record disclose the reason for the incorporation of the several companies at the time such companies were created, although a reason always exists.

Let us look back to conditions existing at the time these corporations were formed. You will have to do it yourselves, as the Commission has not done it for you in its reports. There are valid reasons for incorporation of companies for certain necessary purposes. In fact, the need to incorporate a new company was frequenty absolutely necessary if the public was to be served at all. These corporations were not organized for the mere frolic of doing so, or for the purpose of concealing profits. They were organized because a necessity existed to do something essential to the public welfare which either existing companies could not advantageously do or could not do at all.

Let me cite a few instances to justify the organization of companies. You all recall the closed mortgage for a fixed amount and a definite term. In such a situation, when a demand for greater facilities arose, it was found that the old company could not obtain the necessary capital except at prohibitive rates due to the fact that the existing mortgage was for a fixed amount and its limits were already reached. What easier way was there to meet the public demand than to create a new corporation to construct the necessary power house, the transmission line, or whatever plant facility was necessary, and to mortgage the property of that new corporation. Not to have formed a corporation would often have prevented the new construction and denied the public service. Again, we find restrictive provisions in franchises which prevented existing companies from performing certain much needed functions. Consequently, a new corporation was organized. It might be that it was necessary to condemn land to acquire a right of way. A new corporation organized under a different general law with the power of eminent domain would solve the problem. Again it might be some peculiar provision in regard to taxation. Excessive or unfair taxation laws have frequently provided the motive for forming a new corporation designed to lessen the tax burden and consequently the utility operating expenses for the true benefit to all concerned. It might be that a company desired to take a permit from the Federal Power Commission. Because of the recapture clause, property constructed under such permits, in order to protect its whole property against the recapture clause and the costly regulatory provisions of that body, cannot always be financed under existing mortgages. Also, the commission's operating regulations pertaining to such property might be costly and burdensome if applied to a large inter-connected system. Hence, a new corporation is organized to take the permit, this company in its limited scope submitting fully and completely to the jurisdiction of the Federal Power Commission. It might be that in order to avoid interstate restrictions a company would be organized so as to minimize the extent of interstate transactions, the economies therefrom working for the benefit of the Public, the Stockholder, and the Consumer. It might be that a large plant needed by two separate and unaffiliated interests would require more financing than either existing company alone could bear. Therefore, the two groups would ordinarily organize a new company for such construction protecting their separate interests by operating contracts. Frequently, a corporation is organized for the purpose of constructing an office building or holding real estate for the benefit of a public utility.

It might be advisable and necessary to meet certain statutory exactions which the existing company could not do except at too great a sacrifice; therefore, a new company with small capital and restricted to a sole purpose would effect economies. The pride and the retention of the name of the original company and the consequent restriction of its territory would necessitate a new corporation to serve the additional territory. It might be advisable to separate merchandising activities from operating activities and a new company is formed. It might be that a privilege tax, requiring the contribution of a certain per cent of gross to the community or to the state, is exacted from an existing company, which can be saved to the company and consumer by the creation of a new company. Common sense would dictate the incorporation of that new company. There were formerly states which exacted double liability from the stockholders of public utilities. To facilitate financing in such situations an intermediate corporation was often created. Companies are organized for the purpose of transferring property and forming mergers of existing companies, where, due to restrictive provisions of the law, existing companies are not qualified to receive such properties. It is also in part due to lack of uniform corporation laws throughout the nation. In brief, there is no desire to create additional companies except as there is an actual necessity for such incorporation, but we must admit some such corporations have been continued after the need therefor has ceased to exist. Because of this fact, many of the larger groups in the country are now studying the question of the number of companies in their group and exerting efforts to eliminate as many as possible from the structure. It is needless for me to state an obvious fact, but I believe that where it is possible for you to eliminate any existing corporate units, it will be your purpose and aim to do so. In stating these facts, however, I do not approve some of the complicated structures I have studied. In this day it is well that our corporate set-up be simple.

On behalf of the companies in this industry, I do resent most emphatically the innuendo that because of the existence of a multiplicity of companies there is a shinanigan going on behind the corporate mask. You men are keen and alert to things that are going on today and I know that you, as members of the Edison Electric Institute, are doing your utmost to rectify anything the appearance of which may bring criticism to the industry, whether wholly justified or not. I know, too, that it requires time to accomplish these ends, this due to the chaotic conditions in which we find ourselves at the hour.

It is regrettable that an investigation which has run as long as this, it now being in its sixth year, should be restricted to a book study, if you please, of the most constructive, far-seeing and efficient public serving industry. Senator Walsh stated that the investigation should cover the good in the industry as well as the bad. The Resolution adopted provides that the Commission shall determine "the benefits or detriment of holding companies." The Chief Counsel has stated, "It will be my endeavor, I do not know whether I can do it or not, to get all the facts regardless of whether they are favorable or unfavorable."

With this background and with the cooperation of every company under examination, it seems to me it would be a failure of duty to complete the investigation without a true evaluation of the accomplishments of the industry to offset the technical and little understood bookkeeping and accounting criticisms and implications which have thus far emanated from the Commission. It would be of great public interest to have developed the economic conditions which

existed at the time many things complained of transpired. These difficulties, together with the engineering and technical accomplishments, would make a most thrilling novel in itself. An understanding of the vision, courage and fortitude of the pioneers who developed our electric utilities and thereby brought the greatest gift to the people that has ever been bestowed might replace some of the accusations with praise. The public might be interested to know why electric companies were authorized by state commissions to sell their bonds as low as 75 and to learn why the companies paid what seems excessive rates of interest for the use of money, not under normal conditions, but the accounting records alone do not tell an economic story. They are but cold figures, meaningless in contrast to the great good that was accomplished under most astonishing handicaps. During the war period, the books will not show what you men did to perfect engineering accomplishments which permitted expedition and completion of the things necessary to win the war. The investigation does not show how much money was actually saved to the operating companies and through them, to the public, by the efficiency of the centralized engineering, accounting and managerial services of the holding companies. True, it shows how much money they received, but it does not show what they gave to the operating companies and to the public for the money so received. There we find corporate departments of a holding company with a small capitalization. In one instance I know of, a company was organized for convenience and necessity with a nominal capitalization of but $20,000, and did a six million dollar plus business in four years. Standing alone, this would show a "rate of return" way beyond any reasonable rate, but no one tells us of the value of the work done nor the savings to the operating companies nor the benefit to the public from such work.

It is my hope that Congress will give the commission sufficient money and personnel to finish its task, in order that a full, complete and thorough report will be before Congress on the whole subject before that body considers the recommendations of the Federal Trade Commission for legislation on our industry.

The commission may have the opportunity to broaden the scope of its inquiry and include in that study the other side of the picture, so that when we look in the mirror the good will reflect rather than the bad.

COMMITTEE MEETINGS AT THE CONVENTION

SALES COMMITTEE

The first meeting of the recently organized Sales Committee of the Edison Electric Institute was held at the Palmer House, Chicago, on Monday, June 5. All but four of the twenty-eight members were either present or represented at the meeting. Chairman George E. Whitwell presided, and in his opening remarks explained the plan of organization and the objectives of the committee.

The new chairmen of the Sales Committee subcommittees were introduced and they discussed briefly the major activities planned for the coming year. Mr. C. E. Michel, Union Light & Power Company, St. Louis, will head the Air Conditioning Subcommittee; Mr. M. E. Skinner, Niagara Hudson Power Corporation, Buffalo, will head the Lighting Sales Subcommittee; Mr. D. M. DeBard, Stone & Webster Service Corporation, New York, the Residential Sales Subcommittee; Mr. W. H. Sammis, Commonwealth & Southern Corporation, New York, the Industrial Power and Heating Subcommittee; Mr. P. H. Powers, West Penn Power Company, Pittsburgh, the Rural Sales Subcommittee; and Mr. J. D. Noyes, Detroit Edison Company, Detroit, will head the Wiring Subcommittee.

Mr. G. N. Brown, Manager of the Electric Refrigeration Bureau, and Mr. G. R. Trumbull, Manager of the National Electric Cookery Council, presented optimistic reports on these respective national sales programs. It is pertinent to record here that at a meeting of the Executive Committee of the Cookery Council, at which Chairman P. S. Arkwright presided, it was agreed between the manufacturers and the utility representatives that appropriations would continue on the present basis until Oct. 1, at which time plans for expansion are to be taken under advisement.

Outstanding among the results of the Sales Committee Meeting was the inauguration of a plan for the promotion of lighting. In this respect a resolution adopted by the committee read in part: ". . . there is an opportunity ahead for increasing revenue from all lighting services through concurrent action by all utilities, coordinating with promotion by other groups interested in lighting development; and, therefore, the Sales Committee would name this coming October as Lighting Month, and will expend an appropriate amount in a manner deemed by the committee most productive in gaining increased interest through a program of lighting development."

Other subjects on which action was taken concerned industrial melting and heat treating; the merchandising situation; and electric trucking in connection with freight distribution.

Committee chairmen are now proceeding with the appointment of personnel, and it is expected that the organization of the Sales Committee will be completed at an early date to prevent delay in progressive action on commercial programs.

POWER GENERATION COMMITTEE

The scope and plan of organization of the Power Generation Committee was decided upon at the first meeting of the committee, held at the Palmer House, Chicago, June 5.

The scope of the Power Generation Committee's activities is stated to be "a continuous technical study of the economics of power generation, including the various sources of power now used or in prospect, and the development and operation of mechanical equipment used for power production, including the study of fuels and their utilization in steam generating equipment or in internal combustion engines, the utilization of water power, the design, construction and operation of power stations, the operating characteristics of generating stations and the inter-relation of various costs of generating electrical energy."

The membership of the main committee has been divided into five principal standing groups to consider the main phases of its work as follows:

A Hydraulic group—Mr. Norman R. Gibson, Chairman; a Steam Generating Equipment group—Mr. Alfred Iddles, Chairman; a Turbines and Auxiliaries group—Mr. E. B. Ricketts, Chairman; an Oil and Gas Engine group—Mr. Louis Elliott, Chairman; and a Binary Cycles group—Mr. J. T. Barron, Chairman.

In addition to the foregoing, three subject subcommittees were authorized for the immediate consideration of subjects of present importance as follows: a subject committee on the Economics of Power Generation—Mr. Philip Sporn, Chairman; a subject committee on Outdoor Stations—Mr. George D. Knight, Chairman; and a subject committee on Relations and Arrangements between Utilities and Industries—Mr. F. S. Clark, Chairman.

Mr. Paul W. Thompson was chosen the secretary of the Power Generation Committee. It is tentatively planned to hold three committee meetings during the next year, one in the fall, one in the spring, sufficiently early to prepare a convention report, and one at the annual June meeting of the Institute.

TRANSMISSION AND DISTRIBUTION COMMITTEE

The scope of the Transmission and Distribution Committee includes all activities relating to the transmission and distribution systems of electric power supply companies from the circuit terminals of generating stations to the point of supply for consumers, but excludes substation equipment, power transformers and meters, these subjects being dealt with by the Electrical Equipment Committee. With the foregoing as a general guide to its activities, the Transmission and Distribution Committee at its first meeting, held at the Palmer House, Chicago, June 5, completed its organization and selected certain active subjects with which it proposes to deal at present.

The subjects selected for present consideration by the committee were as follows: wire stringing tensions, wood poles, distribution transformer standards, weatherproof wire specifications, joint use, primary fuses and cut-outs, railroad wire crossings specifications, principles applicable to the National Electrical Safety Code, distribution costs, annual summary of cable operation, annual summary of acceptance, inspection and testing of high voltage cables, correlation of private research projects in high tension cable, a-c low voltage networks, airway lighting and marking, and foreign systems coordination.

Most of these projects were placed in the custody of individual members of the committee, but in two cases small subcommittees were appointed. These were a subcommittee on Distribution Costs, consisting of Messrs. S. M. Dean, Chairman, M. T. Crawford, M. DeMerit and B. L. Hoff, and a subcommittee on Foreign Systems Coordination, consisting of Messrs. H. P. Sedwick, Chairman, and A. E. Silver. These actions were approved at a meeting of the Operating Committee held June 6, 1933.

Mr. L. G. Smith of the Consolidated Gas, Electric Light & Power Company, Baltimore, was chosen to be the secretary of the committee.

It is planned to hold the next meeting of the committee in the autumn, probably early in October.

ELECTRICAL EQUIPMENT COMMITTEE

The first meeting of the Electrical Equipment Committee was held at the Palmer House, Chicago, on June 4, 1933, with Chairman J. Allen Johnson presiding. The meeting was devoted to the organization of the committee, formulation of its scope and the selection of active subjects for consideration by the committee.

The scope of this committee is: "To study the technical characteristics of electrical equipment commonly or principally used in stations and in the measurement and utilization of electrical energy; to study the broad engineering and economic problems involved in the applications and use of electrical equipment in power systems; to guide the economic development of improved designs and practices and to record progress in these fields."

The membership of the committee is organized into three principal groups, the first of these being concerned with meters and utilization equipment, the second with station and substation equipment, and the third with system engineering and operation, including the economic problems involved in the application and use of electrical equipment in power systems. The members of the Electrical Equipment Committee identified with these three groups are: Messrs. J. F. Fairman, Chairman, A. E. Bettis, S. J. Lisberger, A. E. Silver and H. L. Wallau in the Meter and Utilization group; H. W. Eales, Chairman, R. E. Argersinger, George Sutherland, W. F. Sims and R. W. Wilbraham in the Station and Station Equipment group; and Messrs. S. M. Dean, Chairman, J. H. Foote, Philip Sporn, A. H. Sweetnam and E. S. Fields in the Power Engineering group.

In addition to the above, three subcommittees on special subjects were set up and the members of these committees were selected subject to approval by the executives of their companies. The first of these subcommittees is on Energy Diversion and it will devote itself to the study of means for abating the unlawful diversion of electrical energy. Another subcommittee will be devoted to the study of Meter Mountings and associated service entrance practices, a subject of lively current interest in view of the many new methods now available. The third subcommittee was established to deal with active questions arising from the effects of mercury rectifiers on the wave shape of systems, and related general questions affecting wave shape.

Mr. J. O'R. Coleman of the Engineering Staff of the general office of the Edison Electric Institute was chosen secretary of the committee. It is expected that the next general meeting of the Electrical Equipment Committee will be held in the autumn, probably early in October, at a place to be selected later.

ACCOUNTING COMMITTEE

Mr. J. H. Lobban, chairman of the Accounting Committee of the Edison Electric Institute, called a meeting of that committee on June 5, 1933, at the Palmer House, Chicago, for the purpose of organizing committee work for the ensuing year. Seven of the twelve members of this committee were present.

The following scope of activities was recommended for the Accounting Committee.

"The scope of activities of the Accounting Committee shall be to make comprehensive research in the fundamental, financial and accounting problems of the electrical industry; to advise regarding financial and accounting matters relating to the industry; and to develop and disseminate sound financial and accounting principles, methods and practices."

With respect to the Uniform Classification of Accounts for electric utilities, the following resolutions were recommended to the Operating Committee for approval:

1. That the Edison Electric Institute Accounting Committee imme-

(Continued on page 100)

VARIABLE ELEMENTS IN THE COST OF DISTRIBUTION OF ELECTRICAL ENERGY

BY NORMAN H. GIBSON

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A paper presented before the 1st Annual Convention of the Edison Electric Institute, Palmer House, Chicago, Ill., June 5, 1933.

INTRODUCTION

During the past two or three years, attention has been directed to the apparent scarcity of published information about the cost of distribution of electricity. Speaking in the broad sense, literature of industry seldom keeps pace with industrial progress, hence it must not be inferred that electric utilities have neglected the study of their distribution systems or have failed to give them the attention they deserve. Nevertheless, since the question has been raised, a discussion of the subject seems to be in order.

Definition

As a first step, it is necessary to define what is meant by distribution. The physical plant of a large modern electric power system serving more than one community consists usually of ten major elements.

1. Alternating current generating stations (steam or hydro)
2. Step-up transformer substations
3. High voltage transmission lines, including switching stations (usually 44 kv. or above)
4. Step - down transformer substations (called transmission substations)
5. Sub-transmission lines (usually 11 kv. to 33 kv.)
6. Distribution substations
7. Distribution feeders (usually 2,200 to 13,200 volts)
8. Distribution line transformers
9. Secondary mains (at service voltage varying from 115/230 to 120/240, 3 wire and 115/199 to 120/208, 4 wire)
10. Service laterals and metering equipment.

To the fixed charges and operating expenses directly applicable to the above divisions of the system there must be allocated in proper proportion the fixed charges and general expenses covering the many items, too numerous to mention in detail, required to carry on the business; such as, for instance, offices, storage, transportation, insurance, certain taxes, employees' welfare, etc., etc. These expenses may be lumped together for business purposes but they must be allocated when the cost of any one of the divisions of the system is being considered. In addition, the power lost in transmission and distribution must be accounted for.

Such a system comprising generating plants of large capacity at economic locations, high voltage transmission lines capable of transmitting large blocks of electric energy to cities, towns, villages and rural districts and the service system within these places may, for convenience, be divided into two major parts, namely, the Bulk Power System and the Load Area Systems, as originally suggested, it is believed, by the Engineers of the Detroit Edison Company. The former comprises the generating plants, the step-up transformer stations and the high voltage transmission lines and switching stations and the step-down transformer stations. The latter comprises the sub-transmission systems, the distribution substations and the feeders, transformers, secondary mains, laterals, meters and other equipment within the individual Load Areas.

Under such classification the costs of items 1 to 4, as listed above, become matters of Bulk Power supply and are to be included in the determination of the so-called "gateway" cost that is the cost of generation and transmission. The cost of distribution, on the other hand, in its broader comprehension includes all the costs relating to the power Load Area under consideration, namely, items 5 to 10, inclusive. It is, therefore, with all and not a part of the latter group that this study of the cost of distribution of electrical energy is concerned. Intermediate links of sub-transmission and distribution substations listed as items 5 and 6 are often necessary in many parts of a modern electric supply system but are sometimes overlooked and neglected when the costs of distribution are considered. The omission of these two links in the chain is, perhaps, due to the failure to distinguish between a transmission substation and a distribution substation. Frequently it has been assumed that these are one and the same thing but in many cases they are not. Distribution cost, therefore, should include the costs of the sub-transmission systems and the distribution substations in addition to those parts of the system lying between the distribution substations and the customers' equipment.

Some objection will probably be raised against inclusion of the step-down transformer substation among the Bulk Power costs. This is undoubtedly the border line item and there are at least two ways in which it may be classified. Viewed as a substitute for the generating station in a given Load Area, it is to be considered as a part of the Bulk Power supply. From the standpoint, however, of both operation and accounting, it may perhaps be more readily classified as a part of distribution. For the present, therefore, this item has been included with Bulk Power supply but it is expected that a general discussion and expression of opinion will be required before this item can be finally allocated.

Fig. 1 is a map of the Western Division of the Niagara Hudson System illustrating the transmission, sub-transmission and distribution systems as above defined. Fig. 2 is a map of the City of Buffalo illustrating the sub-transmission lines within the city.

Proposition

Among the difficulties encountered in studying distribution costs are the many variables involved in the problem. Some of these have to do with physical conditions and some arise with the passage of time. Attempts have been made by various investigators to arrive at average costs of distribution. Such figures may be applicable within a given Load Area at a definite date but they cannot be used as a basis of comparison without complete knowledge of all the conditions applying to the specific case under consideration. In other words, the fact that the costs found in any other place are greater or less than such average value cannot, of itself, justly be considered as a criticism on the one hand or a compliment on the

other. It is proposed now to discuss some of these variables and how they affect the cost of distribution.

VARIABLE ELEMENTS OF COST

The variables entering into the cost of distribution may be grouped under three general headings:

(a) Conditions existing in different locations
(b) Changes of various kinds occurring with the passage of time
(c) Methods of allocation:
First, with respect to uniform classification of accounts and second (and most difficult) with respect to different classes of service.

As pointed out above, the costs entering into the distribution of electric energy within a given load area must include all the costs between the gateway to the area and the customers' premises. It may be convenient for certain purposes to divide such costs into groups, one group covering sub-transmission and sub-stations and the second group, the distribution feeders, transformers, mains, etc. However, the problem of designing a system to deliver energy from the terminals of the transmission substation to the terminals of the distribution transformers is actually a single problem and the parts of the work assigned to sub-transmission lines and to distribution feeders become a question of economics. The correct solution of this problem at any time depends to a large extent upon the state of the art at that time and hence introduces variable elements in the relation of these two functions which distort the picture from time to time unless all of them are included in the overall cost of distribution.

(a) VARIABLES DUE TO DIFFERENCES IN CONDITIONS

In his recent paper entitled, "Distribution Cost of Electric Energy," prepared under the auspices of the Power Authority of the State of New York, Mr. Clayton W. Pike has listed 16 principal items affecting distribution investments and costs, most of which relate to variable physical conditions. His paper deals only with a part of the cost of distribution; namely, that part included between the outgoing terminals of the distribution substations and the customers' premises. The items which he lists relate largely to such corresponding parts of distribution cost. Some of the items which Mr. Pike mentions apply also to the sub-transmission system and there are certain factors which affect distribution feeder costs in one direction but which may affect sub-transmission costs in the opposite direction.

Common Causes

Following is a brief catalog of some of the more common causes of variation in

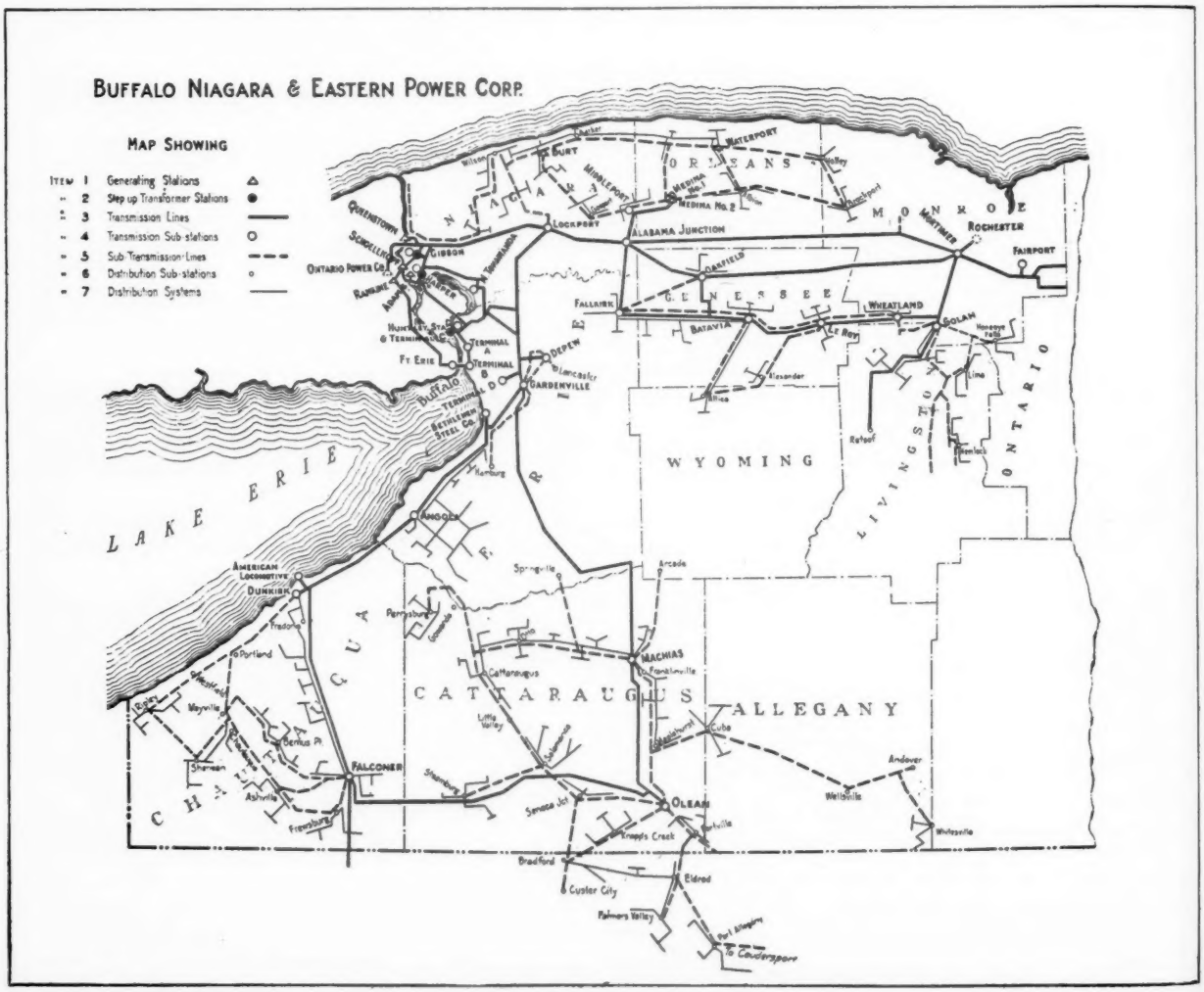


Fig. 1—Map of Western Division of the Niagara-Hudson System showing transmission, sub-transmission and distribution systems.

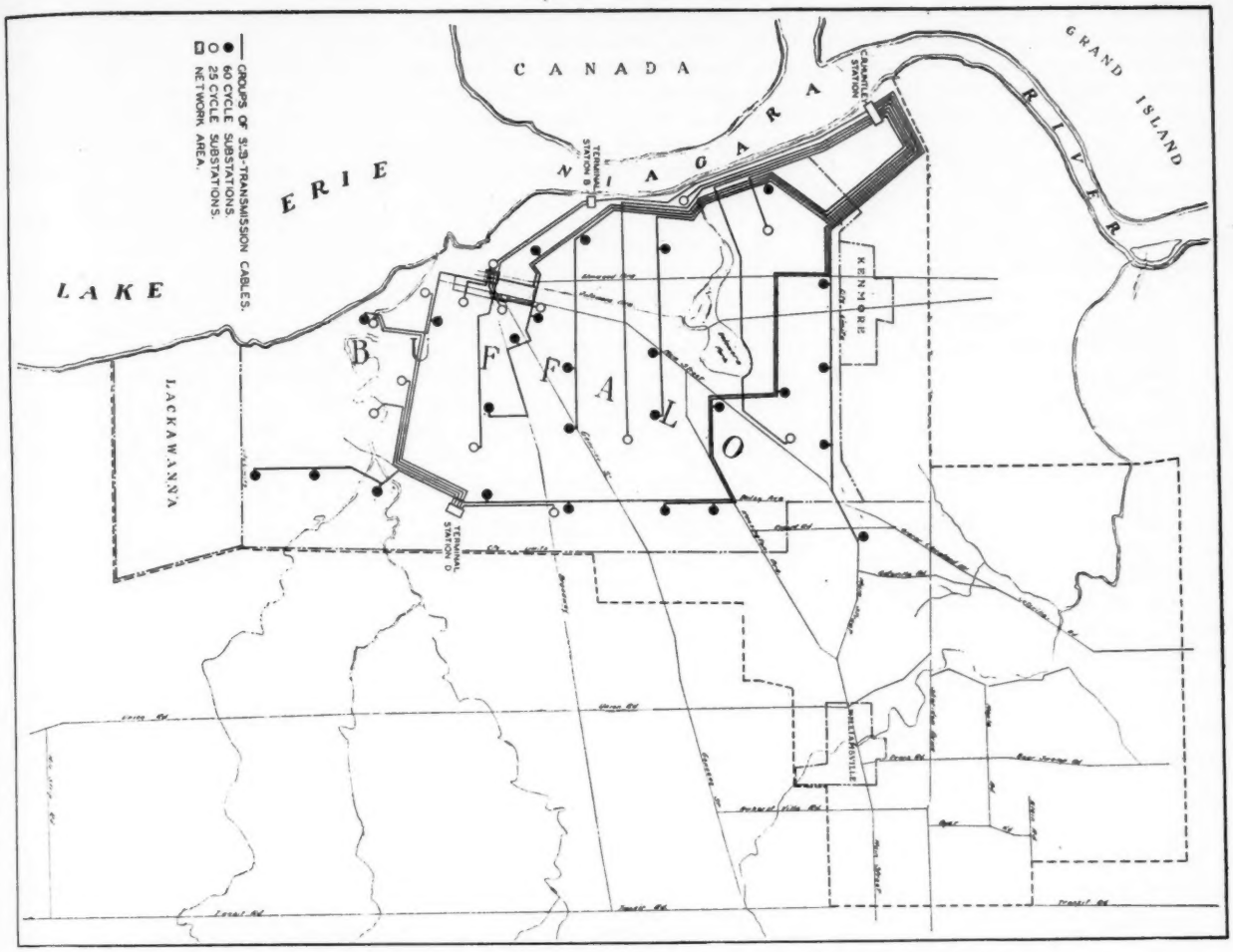


Fig. 2—Map of the City of Buffalo showing sub-transmission lines within the city.

the cost of distribution between different localities:

1. *Nature and quality of the construction.* If underground cables and conduit are used, the capital costs are considerably larger than with overhead construction and the operating expenses are reduced. Cheapening of the quality of construction decreases the capital invested and ordinarily increases the operating expenses.
2. *Number of consumers supplied.* It is obvious that both the capital costs and operating expenses are less when 1000 kw. are delivered to one consumer than when delivered to 1000 consumers.
3. *Density of consumers per unit of area.* Six thousand consumers per square mile can be served at less capital cost and yearly operating expense than if they are scattered over a territory of 6 square miles.
4. *Active load per unit of area.* If a dozen large industries could be concentrated in an area of 40 acres, the capital invested to serve them would be materially less than if they were scattered over 2 or 3 square miles or along a 5 mile waterfront.
5. *Design of the system.* There may be large, manually operated substations and long feeders reaching out 2 or 3 miles, or small automatic substations with short feeders only half a mile long.

   There may be a transformer for each small group of homes in the residential district or the system may be built with extensive secondary lines fed by banks of transformers.

   Even the voltage and number of wires used have a practical bearing on the cost because of the losses of energy.
6. *Kw. demands of the consumers and also the diversity of these demands.* If a given group of consumers were to double their demands for power, it would certainly call for increased capital expenditures and operating expenses.

   Diversity of demand between classes of consumers affects the capacity required in the Distribution substation but has less effect on feeder and transformer capacity, for only in the downtown areas of large cities do we find day-power load and evening lighting load in the same vicinity.

   There is diversity between consumers which is probably highest among residential consumers.

   Combinations of all the above factors in greater or lesser degree make the actual Costs of Distribution different for each City, Village or Rural District.
7. *Competition with other kinds of energy.* One of the most important variables in the cost of distribution of electrical energy is the amount of such energy that the customers use, and one of the principal causes of variability in this amount is competition with other forms of energy. In the early days when the principal service rendered to the domestic consumer was the supply of light only, the competition of kerosene and gas was overcome by the greater convenience, safety and cleanliness of electric light, but today when the largest use of electric energy in the household is for the supply of heat, the competition of gas is not so easily overcome. The effect of such competition for cooking and water heating is very evident in comparing the kilowatt hour consumption of domestic consumers in territories where gas competition is keen with that where it is not. Incidentally it may be noted here that the much talked of "monopoly" which the electric utilities are supposed to possess is, today, if indeed it exists at all, confined almost entirely to the field of furnishing light to residential and commercial customers. In the fields of energy supply for heating and mechanical power, the electric utility industry is in direct and keen competition with other sources of supply.

(b) VARIABLES DUE TO CHANGES OCCURRING WITH THE PASSAGE OF TIME

The customers served by an electric distribution system today have been di-

vided into four general classes, namely, industrial, commercial, residential and rural, besides special classes such as street lighting, transportation, etc. Any or all of these classes or any combination of them may be found in one load area. In considering the variability of the costs of distribution, it is essential to trace the developments that have taken place in the distribution of electric energy to these four classes of customers in the relatively brief span of fifty years.

The first distribution of electric energy was for the lighting of streets in the downtown sections of cities by means of arc lamps supplied by series circuits. This was soon followed by the introduction of electric service to shops in the commercial sections using the same type of series circuits that were used for street lighting. The inherent limitation of the series system restricted its adoption for use inside of buildings and it was not until the development of the incandescent lamp and the multiple system of electrical distribution that the use of electricity indoors became at all common.

Then followed the development of the Edison direct current system of distribution in the commercial sections of cities. The small direct current generating plants that supplied these first Edison systems were located in the heart of the district served and the generation and distribution were both at utilization voltage.

At the beginning the generating plants were operated for only a few hours each evening, resulting in plenty of time for maintenance and, consequently, there was little need for duplication of equipment. On the other hand, the small number of customers resulted in very little diversity and the load factor was very low due to the short time of operation.

The demand for electric service spread rapidly and the variations in the needs of those customers served soon required operation twenty-four hours per day. Better diversity and load factor followed but the necessity for continuous operation required the duplication of equipment in order to permit proper maintenance. As the areas served increased in size, the sites available within the areas were not suitable for the larger steam generating stations then required and it became necessary to locate such stations at points outside of the district served. This was made possible by the development of the alternating current transformer, which permitted economical changes of voltage. Electrical energy could then be generated by alternating current machines and transmitted to distribution substations where the voltage was stepped down by transformers. Conversion to direct current was accomplished by rotating machines and the energy then distributed through the same Edison System that previously had been supplied by the generating stations located in the heart of the system.

As the art developed and the number of customers and the areas served still further increased, the physical and economic limits of the low-voltage direct current system between the substations and the customers were reached and it became necessary to develop the alternating current system of distribution. The Edison direct current system, however, was continued and expanded in the downtown sections where it was justified by the load density. The distribution to the outlying sections was by means of feeders operating at approximately 2200 volts directly from the generating station to transformers located on poles which stepped the voltage down to utilization values for relatively small groups of customers.

As the number of customers and the size of the areas served still further increased, larger generating stations located at greater distances from the Load Areas became necessary. The distances from the generating stations to the load centers and the amounts of power to be transmitted made it economical to use pressures ranging from 11,000 to 33,000 volts. Underground circuits were then used and consequently it was desirable to limit the number of such circuits. This made it necessary to establish distribution substations throughout the Load Area and to step the voltage down to feeder voltage for distribution through the city streets as before.

Simultaneously with the development of the use of electricity in the residential area came the increasing use of electrical energy in manufacturing processes and a rather general increase in the size of manufacturing plants. The problem of distribution of electrical energy to the industrial system in general involved the delivery of large quantities of energy and, therefore, from the beginning, was entirely different from that of the distribution to residential and commercial loads.

As the development of the alternating current system and apparatus made possible the use of higher and higher transmission voltages and, thereby, made economically practicable the development of distant water power, it became necessary to introduce the additional links of step-up transformation at the generating stations, high-voltage transmission and step-down transformation at the gateways to the Load Areas. What previously had been considered high-voltage transmission from generating plants to the substations then became known as "sub-transmission." This was the final step in the development of the ten major elements previously outlined as forming a modern electric power system.

The development of the industry through the various stages outlined represented for each step an encroachment on new and uncharted fields. For each step it was necessary to develop the equipment which would make that step possible. The great number of variables, such as the number of phases, the system of connections to be used, the amount of insulation required, etc., involved in any problem of electrical power supply, made the solution of such problems extremely complicated and resulted in many possible answers to every problem, no one of which could always be definitely stated as the best. Thus it came about that many systems of distribution were developed and applied and, once having been applied, a change to a different system later developed or which may have proved by experience to be better, was difficult and in many cases economically impossible.

An outstanding example of the effect of such variables is found in the matter of "frequency" in alternating current systems. There is almost an unlimited choice in the frequency that might be used in an alternating current system of distribution and at the time that this system was introduced there were many arguments in favor of different frequencies. The inevitable result was that different frequencies were used on different systems, ranging from 15 cycles up to 133 cycles. It was not until rather recent years that the 60-cycles system became generally accepted as standard. However, once this frequency was accepted as standard, it became very desirable for companies operating at frequencies greatly different to change to 60 cycles. The expenditure for such changes represents a very appreciable cost which has been forced on the industry as a result of the development of the art.

Similar facts may be found in connection with the number of phases used in alternating current distribution systems. The three-phase system is today accepted as the standard for the general distribution of alternating current but before this standard was generally accepted many companies had developed

extensive systems of two-phase alternating current distribution. The cost of changing the two-phase systems to the standard three-phase systems stands side by side with the change in frequency as another outstanding cost that has been imposed by the development of the art.

From the very earliest days in the history of electrical distribution up to the present time, careful study has been given to determining the best economic balance between the various elements forming the distribution system in its broader comprehension as defined at the beginning of this paper. The balances between the various elements have been subject to a long period of development and change in parallel with the progress which has occurred in the development of the apparatus employed. For example, until a few years ago, all switching equipment was manually operated and this required the presence of operators in the distribution substations where such equipment existed. This made it economically advisable to use a relatively small number of large substations to serve a Load Area and consequently resulted in relatively short sub-transmission circuits and long distribution feeders. However, with the development of the art, devices were invented which operate such switching equipment without human intervention automatically in response to impulses which indicate conditions existing on the circuits supplied. These developments eliminated the need of operators in distribution substations which in turn made it economically advisable to use a much greater number of small distribution substations with longer sub-transmission circuits and shorter distribution feeders. This one development alone has completely revolutionized the art of electrical distribution and the industry finds itself just in the first stages of this major change at the present time.

Even the distribution secondaries between the distribution transformers and the service entrances to the residences and buildings have played their part in the series of developments. Most of the early secondaries in residential sections of the city were two wire, 110 volts. They were quite ample to supply the early loads over the desired distances. However, as the number of customers and their loads increased, the distances over which these loads could be distributed by the two-wire secondaries became rather limited and there was a rather general change to three wire, 110/220-volt secondaries. This type of secondary at somewhat increased voltage 115/230 or 120/240 is in rather general use today. With the still further increase in residential and commercial loads and with the increasing need of three-phase supply for some of the smaller types of utilization equipment, the industry finds itself today in the early stages of another major change from single phase-three wire to three phase-four wire secondaries, at least in certain parts of the Load Areas.

Time and space do not here permit the mention of all the changes in the art, but those mentioned are typical of the many such changes which have taken place.

Simultaneously with the changes that have been needed to take full advantage of the development of the art have been changes required by evolutions that have taken place within each Load Area during the corresponding period. During the early days of the industry practically all of the distribution feeders, transformers and secondaries were located on poles in the city streets. Since that time there has been a rather continual effort to improve the appearance of city streets and the result is that today there is virtually no overhead electrical distribution equipment or wires in the city streets of the main business sections or the main thoroughfares of our large cities. The overhead construction in the streets has been replaced with underground construction supplemented with overhead pole lines in rear lots, representing an increase of almost 10 to 1 in the cost of that section of the distribution system.

The increase in the business and commercial activities in the downtown sections of our large cities is spectacularly reflected in the skyscrapers that have completely changed their skylines since the beginning of the century. It has been necessary for the electrical distribution system to keep pace with this enormous increase in load density in the large commercial areas. Here again that development of the art which produced automatic switching equipment made it possible to meet this changing condition with a highly economic arrangement. As a result of the development of such equipment, it was possible to eliminate the large and very expensive substations in the congested areas and to use instead small substations located in vaults in buildings or under the streets and sidewalks or even on the various floors of the tall buildings. As a result, electricity may be distributed at sub-transmission voltage to the immediate vicinity of the load itself before stepping down to utilization voltage and yet by means of the low-voltage network and its protective equipment gives service of the highest quality and continuity. This development has resulted in almost complete obsolescence in such high density areas of the older systems that were and still are suitable for supplying the lower density areas.

The progress of the electrical art has always been and still is much faster than the rate of depreciation of electrical apparatus. A design made today in accordance with the most advanced knowledge available may be out of date tomorrow or next week or next year. But service demands must be supplied and plant has to be built to supply them. Construction cannot wait on perfection, and obviously plant built today cannot be discarded tomorrow because something better has been invented in the meantime. It must live out its economically useful life, which, however, on account of the rapid progress of the art, may be and often is, untimely terminated by obsolescence rather than by wear and tear or depreciation. The industry, therefore, always has labored, and still labors under a burden of obsolescence which it cannot escape, and which makes ineffectual any attempt to apply theories of depreciation based on estimated life of equipment. This burden varies under different conditions depending upon many factors such as the date when plant was built, and the degree to which the original design and practice conformed to those later found by experience to be most advantageous and sound. For example, the plant of the original Niagara Falls Power Company at Niagara, now known as the Edward Dean Adams Station, built in the decade between 1895 and 1905, with the advice of the foremost scientists and engineers of the world, is still in good operating condition, but through the combined action of scientific, economic and political causes, it became obsolete as a primary source of power before 1925, or in less than 20 years from its completion, and since the latter date has functioned only as a peak load and reserve station. There is no reason to believe that this station with ordinary maintenance could not continue to furnish power for an indefinite period of time, and when it was built its builders doubtless expected it to do so.

Similar examples may be found throughout the industry and in every property. Neither the condition itself nor its variability are matters for which the present managers of the industry are responsible, since they had their genesis in the knowledge and judgment of a past generation, but it nevertheless is a problem with which these present managers

have to deal, and which affects the present cost of electric service. Doubtless there are many cases where, due to the advance of the art and the present price level, distribution systems could be duplicated today for less money than the existing systems have legitimately cost, but to permit such duplication, either by municipalities or others is not only contrary to the fundamental economic principle of government regulation, but is highly questionable from the standpoint of ethics and equity since such action would destroy the value of existing plant and thus rob security holders for the doubtful benefit of consumers. The net result to the country as a whole would be an economic loss.

Another aspect of this matter arises where an advance in the art necessitates a fundamental change in the system of distribution, such as a change from direct to alternating current or a change in frequency. These usually necessitate alterations or replacement of equipment belonging to the customers, for which, although they ultimately benefit from them, they think the utility should pay. Such expenses being unforeseeable, must of necessity be amortized out of future rather than past income and hence are a legitimate element in the current costs of service.

There was a long period in the development of the electrical industry when the number of consumers of electricity increased at an extremely rapid rate. Every effort of the industry was bent to spreading its facilities to meet the demand for service from a continually increasing number of customers. This stage of development is practically at an end, at least in the urban districts, but the growth of residential load continues as a result of increased use of domestic appliances. It is not possible to wait until this load growth develops and then build the system required to serve it. On the contrary, it is necessary to anticipate the load growth over a reasonable period. This necessary overbuilding represents a very important variable which is reflected in the cost of distribution, since the cost per customer must allow not only for his actual demand but also for the overbuilt capacity necessary to meet his reasonably anticipated future requirements as well.

Another factor that has had a very important bearing on the cost of distribution has been the constantly increasing demand on the part of the customers for a higher quality and greater continuity of service. Any variation in voltage from the nominal value is highly objectionable because of its effect on ranges and other heating elements, any sudden change in voltage is very undesirable because of the flickering effect that it has on lamps and today even the frequency of the system must be regulated so that the time recorded by synchronous clocks throughout the system will not vary more than one or two seconds from the correct value. An interruption to service for even one minute in most of the large industrial plants and in the commercial sections of the cities is considered objectionable. All of these things can only be avoided by increased lines and equipment, duplication and, in some cases, even multiplication of facilities and expensive regulating and high-speed protective equipment. The costs of these measures must be reflected in the cost of distribution and their costs vary widely for different Load Areas, and even for different sections of the same Load Area, depending on the quality and continuity of service required.

The changes that have taken place in transportation, particularly those brought about by the introduction of the automobile, have had a very direct effect on the cost of electrical distribution. What were formerly strictly rural sections are now the suburban sections of our large cities and the residents of those sections expect the same quality of service that is available in the more densely populated areas of the city. There is necessarily a wide variation in the cost of supplying high quality service to such sections as compared with those of higher load density.

All of the changes discussed in this paper, those due to developments in the art itself and those necessitated by changing social conditions have had to be borne by the industry and have necessarily influenced the cost of the service the industry supplies. Some of the changes outlined have reflected a saving in operating expenses but the great majority of them have been required to increase the scope or improve the quality of the service and have been accompanied by corresponding increases in operating costs.

It is evident that not only are there wide variations in the cost of distribution to different classes of load within a Load Area and to different Load Areas but also that the cost of distribution to a given class of load varies over wide limits with the passage of time.

(c) VARIABLES DUE TO NON-UNIFORMITY IN ALLOCATION PRACTICES

In its early days the electric power industry was unregulated. Its accounting practices were simple and no attempt was made to subdivide capital costs or operating expenses. Later on some states began to regulate the industry and each such state set up its classification of accounts. Still later, a uniform classification of accounts was adopted by many states. Much of the property and plant acquired or built under these various regimes is still used and useful in supplying electric service. Insofar, therefore, as historical cost is a factor in the present cost of electric service, it is apparent that the allocation of the costs of similar items of equipment in different properties and at different times will not be the same. This being the case, it is evident that any part of the cost of service, such, for instance, as the cost of distribution, will differ in different properties as such costs are affected by these variable classifications and practices.

An even more significant and important element entering into the variability of distribution costs and their determination, is that of the allocation of capital and operating costs to various service classifications. This variability arises from two causes: first, there are no universally accepted and rigidly defined service classifications and, second, there are no universally accepted bases of allocating costs to the various service classifications used in a particular case.

For instance, some companies include commercial and industrial power in a single class and merely make a distinction between large commercial and small commercial, the point of division between the two often being determined by the judgment and viewpoint of the individual making the classification. Other companies differentiate between commercial and industrial service, considering commercial service to be that supplied to stores, office buildings and in general to customers engaged in trade, whereas industrial service is considered as that supplied to customers engaged principally in manufacturing activities. Some companies make further classifications in terms of size or kind of industry.

Practices also differ between individual managements in the principles used to allocate the amounts set up in the various accounting classifications to the various service classifications. Certain items are allocated on the basis of capacity or demand, others on the basis of consumption, others on the basis of the number of customers and many items are properly allocated partly on one basis and partly on another. These matters are not standardized and there is some question whether, in view of the extreme

variability of conditions in different locations, any standard method of allocation, acceptable in all cases would be of much practical value.

The electric power business is a single unified business. It is not and cannot be divided into separate businesses for each service classification, because there are many parts of the physical plant which are used in common by all classes of service. This is not only necessary but highly desirable, since the diversity between the demands of the various classes of service can thus be used to reduce the cost of service to every class. The maximum possible common use of facilities is, as a matter of fact, developed to the greatest practicable degree by every power utility. It is greatly to the advantage of the public that this should be done but the greater the degree to which such common use of facilities is developed, the more difficult it becomes to determine the cost of serving each particular service classification.

Therefore, if subdivisions of costs are to be attempted, allocations of cost and expense common to all classes of service become necessary. These allocations have to be made on the basis of statistics which are or can be collected in the course of carrying on the business, such as the number of customers the total demand, the total kwhr consumption, and the total revenue of each class of service. These in general are the bases upon which such allocations must be made, but since these values vary from year to year, due to many causes, no fixed percentages over a period of years can be determined as bases for succeeding annual allocations. On the contrary, each year's costs have to be allocated independently of those of every other year. One of the variables which affects the percentages of total cost allocated to various service classifications, is the changing industrial load in periods of business prosperity and depressions, plant built to supply the peak demands of a year like 1929, for instance, is obviously overbuilt for the demands of 1932. Since, however, the industrial load decreased from 1929 to 1932 and the residential load generally increased, it is obvious that the proportion of the total common investment allocated in 1932 to residential service had to be greater than it was in 1929.

Another cause which may necessitate similar yearly allocations is the migration of industries, such as that of the cotton spinning business from New England to the South and the shoe business from New England to the Middle West. Another cause of similar import might be the centralization and decentralization of industries occurring as the result of industrial booms or depressions or through the development of changes in methods of transportation and methods of energy supply such as have been brought about by the electrical industry itself.

Shifts in the relative power requirements of various service classifications have also resulted directly from the developments which have occurred in methods of transportation, such for instance, as the replacement of electric railways by automobiles and buses.

Changes in the proportion of common plant used by various service classifications may also result from the natural growth of the use of electric service by various classes of consumers such, for instance, as the growth in the use of domestic appliances, the increase in commercial lighting, and the extension of rural lines.

There are doubtless many other causes which might be mentioned which would affect these allocations, but the above are sufficient to illustrate the point that the constantly changing conditions in the industry make it impossible to fix them permanently. Furthermore, since these conditions are constantly changing, and cannot be accurately foreseen, it seems impossible to make such allocations currently because the bases upon which they are to be made cannot be determined until after the demand, consumption, etc., have occurred. Such allocations thus become a matter of statistical determination and not of current cost accounting.

DISTRIBUTION SYSTEM LOSSES

Distribution System losses affect the cost of distribution in two respects: first, the energy losses have to be supplied and paid for; second, the power capacity of the system has to be increased over that required for the demands of the customers in order to supply and transmit the power losses.

The cost of system capacity necessary to supply the power losses is accounted for in an existing system by inclusion in the capital costs. However, when estimating the capacity and cost of a system to supply a given customer demand the effect of power losses must be considered, as well as that of diversity which compensates in some degree for the power loss in determining the required plant capacities.

The cost of lost energy depends upon two factors; first the amount of such losses, which varies with the characteristics of the system and of the load, and to some degree with the operating practices followed, and second, the unit cost of supplying such losses which varies with the unit Bulk Power cost.

It is not economically practicable to actually measure the energy losses in each of the ten elements of the system, desirable as such knowledge might be. Energy measurements are usually made only at substations and generating stations in addition to those made at the customers' premises, and from these measurements some subdivision of the losses to various parts of the system can be made. However, even with this division there is no possible way of determining the losses incurred in each service classification except by allocation, since all of the losses thus measured are incurred in common use of the facilities by all or at least by several classes of service. Thus the losses charged to each service class are, and at best can be, but intelligent estimates, in arriving at which calculation, possibly a certain amount of spot checking and an intimate knowledge of the system and load characteristics must be combined with the available measurements. However, since the total losses and certain subdivisions as above mentioned can usually be ascertained allocations can usually be made to reasonable approximations.

Having thus determined the losses to be allocated to each class of service, their cost, of course, depends directly upon the unit cost of Bulk Power. Thus the cost of Bulk Power becomes one of the many variables in the cost of distribution.

METHODS OF COST ALLOCATION TO VARIOUS SERVICE CLASSIFICATIONS

Probably no two persons will entirely agree as to the proper principles and methods to be employed in making loss allocations to the several service classifications. The following statement of methods is given as illustrative of the principles involved, but it is recognized that many other methods may be equally valid.

In general, Special and determinate costs directly associated with larger consumers are charged directly. Other costs are allocated on the basis of demand, consumption, revenue, number of customers, etc., as seems most equitable in each case, as follows:

Capital Costs

1. **Meters—Allocated on the basis of average cost of metering equipment for large consumers, a fixed amount for each other consumer and the balance on the basis of connected load.**
2. **Services—Allocated on the basis of number of consumers.**
3. **Distribution Transformers—Eighty per cent is divided on basis of demand and 20 per cent on basis of**

number of consumers receiving secondary service.

4. Distribution Lines, Poles and Conduit
   (a) Overhead wires used solely for the industrial class are measured from maps and valued. The balance is allocated, 80 per cent on the basis of demand and 20 per cent on the basis of the number of customers receiving secondary service.
   (b) Underground lines used solely for the industrial class are measured from maps and valued. The balance is allocated on the basis of demand.
   (c) Poles are allocated in the same ratios as the overhead wire costs.
   (d) Conduit is allocated on the basis of kw. demand.
5. Distribution Substations—A study is made of each substation. Allocation is usually on basis of space occupied, known value of special equipment and kw. of demand.
6. Sub-Transmission is allocated on kw. demand.
7. General Capital is allocated partly on the basis of space occupied and partly on basis of number of consumers. The overhead accounts, such as engineering, etc., are allocated on the basis of the other capital already allocated.

Operating Expenses

8. Meters—Allocated on basis of number of consumers.
9. Services—Allocated on basis of number of consumers.
10. Utilization Expense—Allocated on basis of number of consumers.
11. Commercial Expense—Certain expenses for some of the classes of consumers calculated and the balance allocated on basis of number of consumers.
12. Transformer Operation and Repair is allocated on the basis of kwhr consumption of consumers receiving secondary service.
13. Distribution Lines, Poles and Conduit are divided the same as the capital for the same items.
14. Substation Operation—A study is made of each station and in general the allocation is on basis of number of feeders used and the kw. demand.
15. Sub-Transmission Expense is allocated on basis of kw. demand.
16. General and Miscellaneous Expense is allocated on basis of number of consumers.
17. New Business is allocated partly on the basis of number of consumers and partly on the basis of revenue.
18. Taxes are allocated partly on the basis of capital allocations and partly on the basis of number of consumers and partly on the basis of kw. demand.

NOTE: *Utilization Expense* includes trouble calls, inspection and other expenses incurred in connection with consumers' premises and equipment.
Commercial Expense includes meter reading, billing, collection, bookkeeping, general labor and supplies in connection with consumers' accounts and records.
New Business Expense includes demonstrations, advertising, canvassing and soliciting and supplies.
General and Miscellaneous Expense includes administrative and general office salaries and supplies, etc., stationery and printing, operation and maintenance of communication system and law, insurance, stores and transportation expenses.

CONCLUSIONS

Analyses of the facts hereinbefore presented discloses that the divisions into which the physical system of an electric power utility naturally fall, as illustrated by the ten major elements listed, are *transverse* divisions, that is, the lines of demarcation between them cut across the system dividing it into sections in series with one other. The records of system costs follow the same arrangement. On the other hand, the division of the system costs required to determine the cost for the several service classes requires a *longitudinal* division of the system, with such divisions in parallel. Since each of the various transverse divisions is used in common by all or at least several classes of service, and hence cannot be physically divided longitudinally, any corresponding longitudinal division of costs can only be made by allocating the cost of the physical plant operating expenses and losses to the various service classifications. Such allocations are subject to many variations, some of which are inherent in the circumstances and some in the judgment of those making the allocations. Thus, in the very nature of the case any stated figures of cost of service must reflect this judgment and can only be as valid as such judgment makes them.

As a matter of fact, because of the inherent limitations, it is highly questionable whether there is any such thing as an ascertainable true cost of electric service to any one class of customers. As pointed out hereinbefore the electric utility business is a single unified business and cannot arbitrarily thus be divided. The further such divisions are carried, the further from recordable facts must the results obtained necessarily be.

Furthermore, even within the above limitations, the ebb and flow of industrial and social conditions, the differences in physical surroundings and the rapidity of development of a new and revolutionary art still only about 50 years old, have introduced and are still introducing so many variables that neither the costs themselves nor the methods of allocating them can yet be fitted into any universal mould.

In considering any statement of the cost of electric service, the above limitations must be borne in mind and the validity of such statement evaluated in terms of all the variables surrounding the particular case to which they apply.

DISCUSSION OF MR. GIBSON'S PAPER

BY H. W. FULLER
Byllesby Engineering & Management Corporation

Mr. Gibson's statement that it will be impossible to establish universal unit costs cannot be disputed but I would like to go one step further and point out that unit costs developed by one company cannot now be compared with those developed by another company for the reason that the uniform classification of accounts for electrical utilities (the 1922 edition is the last one available—a new one is in course of preparation) does not specify definitely enough the allocation of capital, operating and maintenance costs.

The plain, perhaps unpleasant, truth is that we have all failed to realize the importance of agreeing on the factors for determining this large item of our costs.

Mr. Kehoe, at San Francisco in 1930, called our attention to the fact that the capital costs for distribution facilities were increasing at a more rapid rate than the capital costs of other parts of the entire electric plant.

I do not know how the warning affected others, but it caused the managements of our companies to redouble their efforts to find ways and means of reducing distribution costs and I am glad to say we have made definite progress.

The engineers, operators and accountants should immediately make a serious, concerted effort to agree upon a standardized subdivision of transmission and distribution facilities for use by the accountants in setting down, not only capital costs but operating and maintenance costs.

After following the new procedure rigorously for a few years, we will have costs which, while they cannot be used for universal standards, can be used for comparisons.

Some more or less arbitrary decisions will be necessary but if the committee recommending them is competent—and represents the three-mentioned departments of the electric utility companies—there should be no quarrel with their decisions.

Mr. Gibson has mentioned many reasons for variation in the costs of distribution; one of these, "Quality of Service," he touches upon; I feel it should be stressed.

Demands—upon the utility—for com-

munity (general or sectional) improvements is another that is at least worthy of mention.

The character of the terrain covered by the distribution system is another important factor in costs.

I have in mind one city of considerable size where many of the residential —and some of the business—sections are traversed by deep ravines, increasing the capital, operating and maintenance costs to a considerable extent.

It should be possible to secure the interest of the committee on uniform classification, appointed by our predecessor organization, and, if we act quickly, have them incorporate the new ideas suggested by Mr. Gibson.

DISCUSSION BY D. K. BLAKE

General Electric Company

I have read Mr. Gibson's paper very carefully, and I think he has done an excellent job of covering his subject. He lays considerable stress upon the variables, and I want to lay considerable stress upon the variables, too. I want you to consider in connection with the variables this fact, that the distribution system is in conspicuous contrast with the transmission system and the large generating station. It is not built completely and then left alone. It is continually being added to, from place to place and from time to time. It can be properly classified in the realm of transient phenomenon. Furthermore, the distribution system consists of a large number of small units scattered over a large area. And that means it is very difficult to obtain accurate and reliable data.

When you consider the variables from place to place and from time to time, and the difficulty of obtaining accurate and reliable data, that means that there is considerable uncertainty involved in the problem. The variable also means that you must give it attention, and as to that attention that you must give it when it varies, if you want to know how much and where it varies, you must measure it. And all of these taken together, the variables scattered over a large area, to my mind, show conclusively that that part of the system requires now, and in the future, the best engineering talent available to solve its problems.

Another thing, and that is the magnitude of distribution system costs. Mr. Gibson pointed out in his paper a thing that seems to me to be very important. In figuring the cost of distribution to the consumer, you go right on to the meter. In the magnitude of the investment you have a single problem. What we need in the distribution system is a thorough engineering analysis, right from the consumer back to the generating stations or the terminals.

Mr. Gibson pointed out a few things I should like to refer to. He says the cost depends on the number of consumers. It has been a surprise to me that very few engineers in the industry, and executives, too, have noticed that the domestic load, which accounts for more than one-third of your total revenue, is a load that is less than the total transmission and distribution losses on your system. I have made an engineering analysis of my own, and I am persuaded that your future and the engineer's future depends and turns upon this domestic load. It is possible, by means that have already been developed —the radio, the refrigerator, and so forth—to increase domestic consumption as much as 5000 kwhr per year.

Mr. Gibson in his paper makes a distinction, which I think is right, between distribution system costs and distribution economics. Distribution system costs is one thing, and distribution system economics is an entirely different thing. Both vary from time to time and place to place. I wonder if you have analyzed distribution system costs, and have considered them as well from the economic point of view (as Mr. Gear, I think, brought out, too), enough to see that as your density increases your distribution costs do not go down as fast as you might think.

DISCUSSION BY H. B. GEAR

Commonwealth Edison Company

Mr. Gibson has called attention to the fact that comparisons of distribution cost in different cities are of no significance unless there be at the same time a comparison of conditions governing the character of the distributing lines, such as the proportionate part laid underground and the relative density of load in kilowatts per square mile or per city block.

These conditions vary widely in different parts of the same city, the costs per kilowatt of energy demand being materially lower in the sections where population density is greatest, than in sections where population is less dense.

In the city of Chicago, for example, the energy demand in the central section known as the loop district, covering an area of about two-thirds of a square mile, is about 110,000 kw at the peak hour.

Many buildings have maximum demands of 500 to 1000 kw and some city blocks take 2500 to 3000 kw. In this area the peak demand is at the rate of 150,000 kw per square mile. In the areas immediately north and west of the loop district which are served by a low tension Edison D. C. system, the load density is about 25,000 kw per square mile. The total area served by direct current is about six square miles.

Outside this area lie those served by alternating current, amounting to about 180 square miles with a total demand of about 550,000 kw or an average of 3000 kw per square mile. However there are some 180 large users scattered through this area served directly from the 12,000 volt cable system with an aggregate demand of about 200,000 kw. This leaves 350,000 kw of distributed load carried by the 4000 volt radial system with an average density of about 2000 kw per square mile.

In this area there are about 700,000 residential and 120,000 commercial retail users. This includes users of light and power up to 20 kw but the average demand of the entire 820,000 consumers is about .5 kw each.

In certain sections the residential population is housed chiefly in three-story apartment buildings of six to 24 apartments giving upward of 125 consumers in a standard city block 330 x 660 ft. In these sections the neighborhood business streets become important shopping districts with large department stores at carline intersections, and load density rises to 5000 kw per mile.

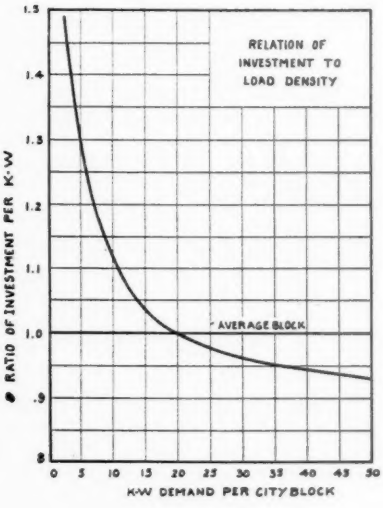
In other sections the population is housed in two apartment buildings or in one family houses or bungalows. Here

there are only five to 20 families per city block and the neighborhood stores are not large. The load in such areas is usually 1000 kw per square mile or less.

The local distribution system serving the outlying area is about 75 per cent overhead. Radial feeders and parts of primary mains on business streets are underground.

In such a system the city block may be regarded as the unit of local investment required to serve it. In the early period of development when there are four or five users in a block, the investment in line, services, and meters in the block is nearly as much as it is for the entire system of feeders, substations, and generating plant from which it is supplied. As more buildings are erected there are added more services and meters and the capacity of the transformer is increased.

Under Chicago conditions the number of users may be increased to about 35 before the initial investment in the



local block has been doubled. By this time, however, the general plant investment outside the local block has increased to about 4.4 times the local investment. In other words, an increase of seven-fold in the demand for energy in this block has made a two-fold increase in the local block and a five-fold increase in total investment.

The total plant investment per kilowatt of demand in the block is about 50 per cent higher when there are five users than when there are 36 users, which is the average consumer density in Chicago.

The variation in the investment per kilowatt of total plant required to supply various demands per city block is illustrated as a ratio to the average block in the accompanying graph.

With 85 per cent of the residential users of electricity in Chicago living in apartments and with an average of 36 consumers per block (and in some sections over 100 per block), it is obvious that the distribution cost for retail service will be somewhat lower than for smaller cities and towns where single family houses are the rule and 10 to 15 consumers per block is more often the average load density.

In the operating expenses the same principle applies though it is not readily evaluated. Less traveling time for meter readers, bill delivery boys, and service men tends to increase the amount of work done per employee per day as compared with similar work done in scattered areas.

Thus both investment and operating costs may vary substantially with load density.

This discussion is intended only to relate to the effect of load density. It is recognized that many other factors exist which may tend to make differences in cost of distribution in different communities.

COMMERCIALISM AND COMPETITION

(Continued from page 76)

ment, out reselling his neighbors on the value of light; every power salesman in the United States, for a period of four to eight weeks, selling light to industry as his primary job, and power uses as his secondary job; every salesman contacting small commercial customers, concentrating on light for illumination, for windows, for signs, for flood-lighting; every appliance salesman never forgetting to sell a higher-wattage light bulb to every prospect or customer? Would it not be possible for every one of us to go home from Chicago and to get under way, in conjunction with his other local outlets, with the manufacturers and with the distributors, a major campaign on lighting?

After all, a national campaign is only an accumulation of the efforts of a large number of local units. Mr. Davidson said there have been five major national campaigns. This proposed sixth one, because of reduced use of light over the last two or three years, can be made the most successful of all if each utility, with all of its man-power and all of its facilities, resells the part of America which it serves on the tremendous value per dollar to every individual that light holds for him. Think it over.

And so we come to the end of our effort to sell you on selling. The present opportunity is tremendous—tools are at hand—the necessity is great. We have given you our sales talk in the way in which we would have given a similar talk to our own salesmen. We have shown you specific examples of what to do and what not to do. We have given generalizations of those instances wherein opportunity seems greatest.

We have spent little time reviewing the past or bemoaning our troubles. Nobody has presented a report—a time-honored custom at meetings of this kind, but one that, to me, has had doubtful value.

We are looking toward the future—we want you not only to say that the need of the electric utility industry is selling—we want you to believe it, to feel it, to go home and back your conviction with time, effort, man-power and money.

We have emerged from the past few years with character as the yardstick by which the public, by and large, will judge us—character of men, character of selling, character of service. These three things—involving, as they do, knowledge, intelligent planning, fair dealing, courageous action and hard work—will bring us into a Promised Land with volume of kilowatt-hour sales so great that unit sales prices will have become so low that we will look back on that which we called accomplishments in 1929 and wonder how we could have been so ridiculously smug in our own self-satisfaction.

RESOLUTION

Passed at the First Annual Convention of the Institute

RESOLVED, That the thanks of the Edison Electric Institute, in convention assembled, be extended to Mr. E. W. Lloyd, vice-president of Commonwealth Edison Company and chairman of the Institute's Convention Committee, and to the members of his committee, to the Commonwealth Edison Company and to the other public utility organizations in the City of Chicago, to the Honorable Edward J. Kelly, Mayor, and the City of Chicago, to Messrs. L. R. Bell and G. E. R. Flynn and the staff of the Palmer House for the careful arrangements and many courtesies which have made the meetings profitable and the sojourn here pleasing and enjoyable.

WINNERS OF 1933 PRIZE CONTESTS

Winners in the prize contests which closed on April 1st and which were sponsored by the National Electric Light Association were announced at the convention. Prizes were awarded as follows:

Prizes to Companies for Accomplishments in Specified Activities

Augustus D. Curtis Award

To the company showing the greatest contribution to the advancement of Electric Lighting of Commercial and Public Buildings during 1932.

Certificate awarded to—Alabama Power Company, Birmingham, Alabama.
To the individual in that company responsible for the achievement.
Cash Prize of $250 to—Mr. J. S. Sutherland.

James M. Gilchrist Award

To the company showing the greatest contribution to the advancement of Electrical Advertising during 1932.

Gold Medal awarded to—Sioux City Gas & Electric Co., Sioux City, Iowa.
To the individual in that company responsible for the achievement.
Cash Prize of $250 to—Mr. C. R. Tracy.
Honorable Mention to—Detroit Edison Company, Detroit, Michigan.
To the individual in that company responsible for the achievement.
Cash Prize of $150 to—Mr. T. F. Gessner.

Thomas W. Martin Rural Electrification Award

To the company showing the greatest contribution to the advancement of Rural Electrification during 1932.

Bronze Plaque awarded to—Alabama Power Company, Birmingham, Alabama.

Prizes to Individuals for Papers on Subjects Relating to the Electric Light and Power Industry

H. M. Byllesby Award (Subject—Accounting)

First Prize, $250—Mr. V. Thiemann, Wisconsin Public Service Corp., Green Bay, Wis.
Second Prize, $150—Mr. Louis N. Rowley, Jr., Brooklyn Edison Co., Inc., Brooklyn, N. Y.
Third Prize, $100—Messrs. Richard L. Fuller and Herman W. Bevis, Columbia Gas and Electric Corp., New York, N. Y.

James E. Davidson Award (Subject—Commercial)

First Prize, $250—Mr. H. M. Sawyer, American Gas & Electric Co., New York, N. Y.
Second Prize, $150—Mr. Gilbert K. Hardacre, Public Service Co. of Northern Illinois, Chicago, Ill.
Third Prize, $100—Mr. E. K. Leary, Alabama Power Company, Sheffield, Ala.

Henry L. Doherty Award

Gold Medal—Mr. Walter J. Lyman, Duquesne Light Company, Pittsburgh, Pa.

B. C. Forbes Award (Subject—Public Relations)

Cash Prize, $250—Mr. John M. Whittier, The Edison Electric Illuminating Company of Boston, Boston, Mass.
Honorable Mention—Mr. Albert R. Stevens, West Penn Power Company, Pittsburgh, Pa.

A. L. Lindemann Award (Subject—Electric Cookery)

First Prize, $150—Mr. C. M. Baldwin, Minnesota Power & Light Co., Duluth, Minn.
Second Prize, $100—Miss Hazel Auchmuty, Mississippi Power Company, Hattiesburg, Miss.
Third Prize, $50—Miss Florence Freer, Brooklyn Edison Co., Inc., Brooklyn, N. Y.

James H. McGraw Award (Subject—Engineering)

First Prize, $250—Mr. Walter J. Lyman, Duquesne Light Company, Pittsburgh, Pa.

Second Prize, $150—Mr. W. T. Crook, Jr., Safe Harbor Water Power Corp., Safe Harbor, Pa. and Mr. G. S. Diehl, Pennsylvania Water and Power Co., Baltimore, Md.

Third Prize, $100—Mr. George C. Cook, Brooklyn Edison Co., Inc., Brooklyn, N. Y.

SEVEN PRIZE AWARDS TO BE ADMINISTERED BY THE INSTITUTE

The Prize Awards Committee has announced that seven awards, formerly sponsored by the National Electric Light Association, have been offered by the donors and accepted by the Board of Trustees for administration by the Edison Electric Institute. The prizes are on a competitive basis, and awards will be based on exhibits or papers to be submitted by competitors in accordance with the conditions governing the prizes. The prizes will be awarded at the 1934 convention of the Institute. They are as follows:

Charles A. Coffin Award—(Sponsored by the General Electric Company)

A Gold Medal, known as the Charles A. Coffin Medal, will be awarded to the public utility operating company within the United States which, during the year 1933, has made a distinguished contribution to the development of electric light and power for the convenience and well being of the public and the benefit of the industry. The company awarded the medal will also receive $1,000 for its employees' benefit or similar fund.

George A. Hughes Award

A cup donated by Mr. George A. Hughes, President, Edison General Electric Appliance Company, Inc., to the company member of the Edison Electric Institute showing the greatest contribution to the development of the domestic electric cookery load, through promotion, or selling, or both, during the contest period; and cash prizes totaling $1,000 to the individuals responsible for the achievement.

Thomas W. Martin Award

A bronze plaque donated by Mr. Thomas W. Martin, President of the Alabama Power Company to the company member of the Edison Electric Institute showing the greatest contribution to the advancement of rural electrification during the contest period.

H. M. Byllesby Award

Cash prizes of $100, $50, and $25, donated by the Byllesby Engineering and Management Corporation, in memory of Colonel H. M. Byllesby, for the three most meritorious papers showing how to increase the usefulness of the accountant in the public utility industry.

B. C. Forbes Award

A cash award of $250 donated by Mr. B. C. Forbes, Editor, Forbes Magazine, for the most meritorious paper dealing with the subject of Public Relations in the electric light and power industry.

A. L. Lindemann Award

Cash prizes of $150, $100, and $50 donated by Mr. A. L. Lindemann, Vice-president and General Manager, A. J. Lindemann & Hoverson Company, for the three most meritorious papers dealing with the advantages of electric cookery for domestic purposes.

James H. McGraw Award

Cash prizes of $250, $150, and $100, donated by Mr. James H. McGraw, Chairman of Board, McGraw-Hill Publishing Company, for the three most meritorious papers on any engineering or technical subject relating to the electric light and power industry.

Mr. Kenneth Curtis, the donor of the August D. Curtis Award, formerly administered by the National Electric Light Association, has expressed a desire to continue the Curtis Award. However, the first award under the administration of the Institute will not be made until 1935 as it is desired to change the conditions and form of the award as previously offered.

In a statement accompanying this announcement Mr. Frank W. Smith, Chairman of the Prize Awards Committee, said: "These awards have been established through a desire on the part of the donors to encourage and promote progress in the electric light and power industry. They serve also as recognition for outstanding accomplishments. In the past they have brought forth many valuable contributions to the Central Station Art. They are an incentive to our young men and women to engage in research, exercise their imagination, and to give expression to constructive thought, and the efforts put forth in preparing for these contests add an important item to the individual's personal and professional equipment.

"At an early date, an announcement giving complete details of the contests will be released to the membership, and the executives of our companies are urged to lend their support in encouraging interest in the awards and participation in the contests by their employees for the splendid prizes available."

PRIZE WINNERS IN REFRIGERATION BUREAU CONTEST

Enthusiastic Attendance at Refrigeration Meetings

For outstanding accomplishments in the field of local cooperative electric refrigeration organization and sales promotion effort, the committee of judges in the Electric Refrigeration Bureau's "Legion of Honor" contest has rewarded 14 men, representing all of the 11 regional divisions of the Bureau, with election to membership in the Refrigeration Legion of Honor.

George R. Conover, managing director of the Electrical Association of Philadelphia, Inc., Philadelphia, Pa., was awarded the grand prize, consisting of a gold loving cup and designation as Commander of the Refrigeration Legion of Honor, for the most meritorious achievement in the entire country.

The regional division winners, each of whom was awarded a silver loving cup, were as follows:

New England Division—Richard Lincoln, manager of the merchandise department, The Edison Electric Illuminating Company of Boston, Boston, Mass., and Guy G. Smith, advertising manager, Cumberland County Power & Light Company, Portland, Me. Honorable mention was awarded to G. H. Sander, district manager, Public Service Company of New Hampshire, Manchester, N. H.; C. A. Ingalls, division manager, Central Vermont Public Service Company, Middlebury, Vt., and W. O. Minard, Central Vermont Public Service Company, Claremont, N. H.

Eastern Division—G. J. Reichert, appliance sales manager, Buffalo, Niagara & Eastern Power Corporation, Buffalo, N. Y., and H. I. Sanctuary, sales supervisor, Central Hudson Gas & Electric Corporation, Newburgh, N. Y. Honorable mention was awarded to J. H. Van Aernam, sales promotion manager, New York Power & Light Company, Albany, N. Y.; I. Borstein, president, Borstein Electric Supply Co., Camden, N. J., and L. R. Leslie, commercial sales manager, Delaware Power & Light Co., Wilmington, Del.

East Central Division—Ralph H. Jones, appliance division, Electrical League of Cleveland, Ohio.

Southeastern Division—A. G. Morgan, sales manager, Virginia Electric & Power Co., Richmond, Va. Honorable mention was awarded to W. G. Gay, district sales manager, Virginia Electric & Power Co., Norfolk, Va.

Great Lakes Division—C. E. Collins, district manager, Western United Gas & Electric Co., Elgin, Ill. Honorable mention was awarded to H. W. Cooper, commercial manager, Wisconsin Power & Light Co., Madison, Wis.

Middle West Division—R. C. Geppert, general superintendent, Nebraska Power Co., Omaha, Neb. Honorable mention was awarded to C. E. Michel, sales manager, Union Electric Light & Power Co., St. Louis, Mo., and C. F. Farley, vice-president and merchandise manager, Kansas City Power & Light Co., Kansas City, Mo.

Pacific Division—J. Clark Chamberlain, secretary-manager, San Diego County Electric Refrigeration Bureau, San Diego, Cal.

Northwestern Division—R. B. McElroy, merchandise sales manager, Washington Water Power Co., Spokane, Wash. Honorable mention was awarded to R. E. Folland, executive secretary, Electrical League of Utah, Salt Lake City, Utah.

North Central Division—L. L. Pelley, sales supervisor, Northern States Power Co., St. Cloud, Minn. Honorable mention was awarded to B. L. Palm, new business manager, Northwestern Public Service Co., Huron, S. D.

Rocky Mountain Division—J. E. Flynn, merchandise manager, New Mexico Power Co., Santa Fe, N. M.

Southwestern Division—T. E. Fielder, assistant manager, sales development department, Oklahoma Gas & Electric Co., Oklahoma City, Okla. Honorable mention was awarded to W. E. Clement, commercial manager, New Orleans Public Service Co., New Orleans, La.

It is to be noted that in the above list there are two first prize awards in each of two divisions, the New England and the Eastern. In each of these divisions there was such a preponderance of entries and a number of the exhibits submitted were of such extremely meritorious character that the judges felt justified in exercising their discretionary power under the rules of the contest by dividing the first honors between two contestants. In fact, so close was the competition in several of the divisions that the judges were obliged, after weighing the minutest competitive details, to consult the Bureau's home office statistical records before arriving at their decisions. Moreover, it goes without saying that in bestowing these individual awards through the decision of its chosen judges, the Bureau not only gives recognition to the personal efforts of the contestants but acknowledges, in each instance, the effective work of all the organizations and interests whose solid cooperation has brought to the local refrigeration campaigns such conspicuous success.

In passing, it might be well to mention some of the factors which entered into the selection of Mr. Conover as the winner of the Grand Award. In Mr. Conover's behalf there was submitted a most attractive and comprehensive folio on the Philadelphia refrigeration campaigns of 1931, 1932 and 1933, all conducted under his supervision. All told, there have been five annual spring refrigeration shows held in the Quaker City, and in addition, refrigeration has been strongly featured in the Electrical Association's last two fall electric and radio shows. The sales results of these exhibits have been truly sensational, as have been those in Chester, Pa., where Mr. Conover and his organization have carried on an extension campaign each year. Throughout the Philadelphia activity the Bureau's national trademark slogan has been conspicuously displayed and practically 100 per cent use has been made of the Bureau's advertising and promotional material.

The judges, whose contribution to the success of the contest is hereby gratefully acknowledged, were A. W. Berresford, managing director, National Electrical Manufacturers Association; J. C. Sterling, advertising director, McCall's Magazine, and E. Kobak, vice-president, McGraw-Hill Publishing Co., Inc. The cups, suitably inscribed, have already been sent to the various prize winners.

APRIL SALES SHOW BIG GAINS

Household electric refrigerator sales throughout the country registered a marked gain in April, the total for the month being estimated at 127,917 units. This compares with 58,494 units sold in March and 112,643 sold in the entire first quarter of this year. April sales this year, however, were behind those of April, 1932, by 17,381 units.

The total for the first four months of this year was 240,560 and represents 83.3 per cent of the national quota for the period. On the basis of the four months' figures 14 States are now ahead of their quotas, the percentages of the leaders being as follows: Alabama, 149.1 per cent; South Carolina, 139.7 per cent; Maryland and District of Columbia, 138.1 per cent; Missouri, 135.3 per cent; West Virginia, 134.7 per cent; Virginia, 133.6 per cent; Georgia, 132.2 per cent; Texas, 129.8 per cent; Oklahoma, 128.6 per cent; North Carolina, 115.8 per cent; New Mexico, 111.9 per cent; Arizona, 109.4 per cent; Colorado, 106.4 per cent; Kentucky, 104.2 per cent. Runners-up, each of which is nearly 100 per cent, are Delaware, Arkansas and New York.

While the final figures on the May

(*Continued on page* 96)

SPRING MEETING OF THE JOINT SUB-COMMITTEE ON DEVELOPMENT AND RESEARCH

The spring meeting of the Joint Sub-committee on Development and Research was held in New York on May 25. Division 1, which treats of subjects involving noise frequency induction, met in the morning with Mr. W. F. Davidson presiding. The attendance at this meeting was approximately 45. Division 2, which deals with low frequency and structural coordination, met in the afternoon with Mr. A. E. Silver presiding. The attendance at this meeting was about 55.

Since the fall meeting, there has been a simplification of the project committee set-up involving the combination of certain committees and the dropping of others whose work was completed. As a result there are now three project committees in Division 1 and six in Division 2, making a total of nine instead of fifteen as formerly.

Division 1—Noise Frequency Studies

The three project committees of this division presented progress reports describing their activities for the past six months and their plans for the future. They also presented five technical reports which are briefly abstracted below.

The project committee dealing with Noise Induction has made additional field trials of the use of exploring wire methods in investigations of both toll and local telephone circuit noise. Based on this work and the studies previously covered in Provisional Report No. 8, the project committee prepared Technical Report No. 1A-9 entitled "Exploring Wire Methods for Toll and Local Circuit Noise Studies." By the methods described in the report it is possible to evaluate the influence of power circuit currents and voltages without making measurements in the power lines. In developing these methods, the practical requirements of simplicity of technique and portability of equipment were given consideration secondary only to that of reasonable accuracy of results. The test procedure involves essentially only noise measurements on the exploring wires which, with simple formulas, may be used to estimate noise induction in telephone lines.

The project committee working on Noise Evaluation has completed the analysis of the results of the laboratory studies of noise effects based on the articulation testing method. Some outstanding results of this investigation are given in Technical Report No. 1B-4 entitled "Articulation Studies on the Effects of Noise." This report discusses the performance of circuit noise measuring devices, including both the ear comparison method and experimental models of indicating instruments. A method is described for expressing the effect of circuit noise in terms of a certain amount of transmission loss. This is derived from laboratory results and will need to be subjected to engineering study in connection with practical field conditions before being applicable to general use. The report also discusses a rule of combination for complex noises.

The project committee concerned with Wave Shape and Selective Devices has been concentrating its attention on the effect of mercury arc rectifiers on the wave shape of the a-c supply system. Based on experience obtained in connection with several operating problems and in the survey conducted last year, the project committee has prepared Technical Report No. 1C-11 entitled "Wave Shape Characteristics of Power Circuits Supplying Rectifiers." This report presents a study of the factors influencing the problem and describes an empirical method for estimating the magnitudes of the harmonic currents and voltages introduced on the system by the operation of the rectifier. This method is expected to prove helpful in determining the degree of wave shape distortion to be expected in advance of actual installations and to permit the calculation of the effectiveness of various remedial measures which may be applied in individual cases. A number of measures applicable to the power system are described, by means of which the harmonics introduced into the system by a rectifier may be reduced. This committee also prepared Technical Report No. 1C-12 entitled "The Impedance of A-C Supply Systems at Harmonic Frequencies to Balanced Components." This report discusses methods of estimating the impedance of systems by the use of an approximate equivalent circuit, each portion of which represents the impedance of a line or a piece of connected apparatus. A summary of the data required in calculating the equivalent impedance of overhead and cable circuits, transformers, reactors, voltage regulators and various types of rotating machinery, is presented, together with the required formulas.

This committee also presented Technical Report No. 1C-10 entitled "Selective Devices for Reducing Harmonics in Power Systems—Part I—D-C Systems," which was practically completed by the former committee on Selective Devices. This report describes the design and application of selective devices suitable for use in d-c systems, and also discusses briefly the sources of harmonics in rotating machinery and the d-c side of rectifiers. Some data are given regarding the internal impedance at harmonic frequencies of various types of rotating d-c machines and rectifiers. Methods are also described for measuring the internal impedances of d-c machines as well as d-c system impedances in individual cases.

Technical Reports 1A-9, 1C-10, 1C-11, and 1C-12 were presented with the suggestion that they be made Engineering Reports.

Division 2—Low Frequency Studies

The six project committees of Division 2 reported the progress of the work on their assignments which has been made during the past six months. In addition, four technical reports were presented—three of them as information to the Joint Sub-committee on Development and Research and one with the recommendation that it be made a Provisional Report.

The project committee on Protectors for Open-Wire Lines presented Technical Report No. 9 entitled "Installation and Measurement of Low Resistance Grounding Systems." This report describes the methods of making low resistance grounds in connection with the installation of short circuit relay protectors. The report covers the construction of grounds in various parts of the country, frequently under rather adverse conditions. In most cases, the resistance of the ground structure was 3 ohms or less. Several methods of construction were used but that most generally followed was that of paralleling a number of 5 ft. ground rods. In some cases chemical treatment was employed. Measurements were made of the resistance of the grounding system as additional rods were connected in parallel, thus giving considerable data on the efficiency of paralleling the rods. Measurements have been made of the resistance of these ground structures at regular intervals for a period from one and one-half to two years, both for the

chemically treated and the non-treated structures, and these data are included in the report. In order to provide an adequate record of this work the committee felt that the information in this report should be treated in more detail than was desirable for a report intended for general circulation. Another report is therefore in preparation, giving the information contained in this report in a condensed form, together with other information on ground structures collected from various sources.

The project committee, dealing with Acoustic Shock Reduction, presented Technical Report No. 2 entitled "Devices and Methods for the Reduction of Acoustic Shock" which gives a historical review of a number of devices proposed and studied over a period of years. Most of the devices investigated were unsatisfactory for one reason or another. Many of them gave a satisfactory reduction of acoustic shock but produced objectionable transmission losses in the telephone system. Others were satisfactory from the transmission standpoint but did not give sufficient acoustic shock reduction. The methods which are now in use or have promising possibilities, such as the 1-A reducer, which utilizes a stepup transformer, the copper oxide reducer, and amplifier types of reducers, are briefly described in the report. The committee plans to prepare separate technical reports dealing with the devices which appear to warrant further consideration. A report describing the 1-A reducer has been available for some time.

The committee working on Special Devices and Methods presented its Technical Report No. 2 entitled "Neutralizing Transformers." This is in the nature of an interim report discussing the use of neutralizing transformers designed for the protection of telephone circuits exposed to 60 cycle induction. The report treats of the general design requirements of a neutralizing transformer, the laboratory tests on 12 units which were built for field trial installation, and gives the results of field tests of the transformers installed on an open wire toll circuit. These tests included measurements under the condition of induced voltages due to faults to ground on a parallel power circuit, and the effects of the transformer on the normal operation of voice frequency telephone, and ground return telegraph circuits operating through the transformers. The committee feels that further information will be required before general conclusions can be drawn as to the effect of these transformers on the normal operation of the telephone circuits.

The project committee concerned with Construction, in its Technical Report No. 1 entitled "Power Line Construction Study (6.6-33 Kv)," has summarized an investigation of the effect of construction details upon the performance of different wood pole transmission lines in the voltage range from 6.6 to 33 Kv. Twelve operating companies participated in the study over a period of two years, submitting data concerning outages of selected lines and concerning dielectric failures occurring on structures in these lines. The data collected showed the nature of the failure and such details as the path of the arc, the pole head configuration, type of construction, clearance, etc. The great majority of the faults on these lines were due to lightning and therefore most of the report is devoted to a study of the construction features of the line which effect its performance from the standpoint of lightning. The report was submitted with the recommendation that it be made a Provisional Report.

REFRIGERATION BUREAU CONTEST

(*Continued from page* 94)

sales are not yet available the Bureau is hopeful that the total for the first five months of the year will be in the neighborhood of 380,000 units, which figure is approximately half of the total for the entire year of 1932.

MANY LARGE MEETINGS

The Bureau's optimism regarding the year's results, and particularly those of the next few weeks, is not without grounds. Never before in the history of the Bureau has there been such large and enthusiastic attendance at refrigeration meetings as has been registered in the past six weeks. Five hundred and fifty at Easton, Pa.; 700 at Reading, 200 at Lebanon, and 117 and 97, respectively, at 8 a. m. meetings in the little cities of Ithaca and Oneonta, N. Y. Other big meetings were held in May in Hanover, Pa., Walton, Norwich, Liberty, Jamestown, Watertown and Potsdam, N. Y.; St. Louis, Kansas City, Pittsburgh, Oklahoma City, Shawnee, Muskogee and Richmond, Va., while the June schedule includes sessions in Newport News and Norfolk, Va.; East Orange, N. J.; Buffalo, St. Louis, Minneapolis and series of meetings in Minnesota and Wisconsin.

TREND OF RATES

(*Continued from page* 64)

let us make a schedule without any demand charge but based upon load factor with blocks based upon hours use of the customer's demand. It will be pointed out that the customer with a demand of 2000 h.p. can install and operate a plant with greater efficiency and at lower fixed charges per unit of demand than the customer who has a demand of, say, 100 h.p. Every successful rate structure must recognize this situation.

Any power rate structure to be successful must be flexible. It must meet changing conditions, it must meet the cost of the isolated plants, some of which operate under peculiar characteristics.

If I were asked to point out a distinct trend in rates today, I would say that there is a tendency towards uniformity of rate schedules for the territory served by the single company. That practice has gained much ground in recent years. It has social, economic and political advantages, and I doubt if any company which has adopted that practice would voluntarily depart from it. I believe that the pressure brought to bear by the different communities and by the general public will compel such uniform rate schedules sooner or later.

One thing is clear, if rates for residence service are going to keep on going down and down and taxes keep on going up and up, then sales must be increased so that net revenues may be maintained or bettered. This means that the customers must be sold more lighting and more appliances. Without offering any suggestion as to how this increased lighting and how the appliances are to be sold, the unavoidable fact remains that they must be sold and the utilities must be very aggressive in this respect. In my opinion this constitutes the real problem before the electric utility industry today.

Editor's Note: Due to space limitations it is necessary to defer to a later issue publication of Mr. E. J. Fowler's discussion of Mr. Newton's paper.

PUBLICATIONS FOR SALE

The Edison Electric Institute purchased from the Liquidating Committee of the National Electric Light Association all of its stock of publications and, while space requirements have made it necessary to thin out the older publications and those not in much demand, a reasonable number has been kept to meet the regular demand of the electric light and power companies.

A new price list will be issued in the near future but in the meantime the old NELA list of publications can be followed except for discarded older publications.

POWER SALES ITEMS

AIR CONDITIONING

"Unit-Type Air Conditioning System Modernizes This Large Department Store," A. W. Moulder, Manager, Heating-Power and Industrial Piping Division, Grinnell Co., Providence, R. I. Heating, Piping and Air Conditioning, March, 1933, pp. 137-41. Engineering Publications, Inc., Publisher, 1900 Prairie Ave., Chicago, Ill.

BREWERIES

"What the Brewery of the Future Will Look Like," Victor Buhr. Food Industries, April, 1933. McGraw-Hill Publishing Co., Inc., 330 W. Forty-second Street, New York City.

Up-to-date layout and management principles for a revived industry.

DIESEL ENGINES

"Exposing Omissions in 'Savings' Contracts for Diesels," Dean Taylor, Utility Management Corp., New York City. Electrical World, April 15, 1933, pp. 476-9. McGraw-Hill Publishing Co., Inc., 330 West Forty-second Street, New York City.

"Diesel Engine Costs." Power Plant Engineering, April, 1933, pp. 181. Technical Publishing Co., Monadnock Block, 53 W. Jackson Boulevard, Chicago, Ill.

Detailed costs of 11 central station plants located in Middle Western States show total operating costs of from 5.5 to 13 mills per net kilowatt hour.

ELECTRIC FURNACES

"Heroult Electric Furnaces at Dagenham Works of Ford Motor Company, Limited." Iron & Coal Trades Review, March 10, 1933, pp. 377-8. Industrial Newspapers, Ltd., 29 Wellington Street, Strand, London W C 2, England.

Notes on two 15-ton electric furnaces for refining metal from mixers supplied by blast furnace; Heroult furnaces are of 3-phase type with 3 top electrodes, each 14 in. diameter.

ELECTRIC HEATING

"Industrial Electric Heating," N. R. Stansel and L. C. Athy. General Electric Review, April, 1933, pp. 194-200. General Electric Co., Publisher, Schnectady, N. Y.

Notes on base metals; raw materials; wet process; dry process; tables showing raw material for porcelain enamels, compositions of enamel frits for sheet steel, mill additions, and composition of enamel frit for cast iron.

ELECTRO-CHEMISTRY

"Electricity in Chemical Processes," Colin G. Fink, Columbia University, N. Y. Electrical Engineering, March, 1933, pp. 151-4. American Institute of Electrical Engineers, 33 West Thirty-ninth Street, New York City.

The applications of electricity to chemical processes are increasing at a startling rate. In this article the development of electrochemical processes including the production of many metals and other products is reviewed, and the amounts of electric energy consumed by the various processes over the past 10 or 15 years are given. Predictions are made for a greatly expanding use of electricity in the next decade.

MOTORS

"Fitting Motors and Clutches to High-Inertia Loads," R. S. Elberty, General Engineering Dept., Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. Electrical World, Jan. 21, 1933, pp. 92-4. McGraw-Hill Publishing Co., 330 West Forty-second St., New York City.

MOTOR DRIVES

"Industrial Installation Planned for Maximum Economy," J. G. Carriere, Electrical Engineer, Shell Chemical Co., and C. F. Henderson, Electric Machinery Mfg. Co., San Francisco. Electrical World, Mar. 25, 1933, pp. 392-5. McGraw-Hill Publishing Co., 330 West Forty-second Street, New York City.

New plant of the Shell Chemical Co., first of its kind in the United States to employ the recently developed low-pressure process of ammonia synthesis, has installed capacity of more than 13,000 hp., two-thirds of which consists of large synchronous-motor units. Power, being a major item in production cost, demands an installation developing high load factor and high power factor for maximum economy.

MOTOR-STEAM DRIVES

"Comparative Operating Costs of Plant Auxiliaries with Steam Drive and Motor Drive," H. C. Moore, Jr. Southern Power Journal, April, 1933, pp. 10-12. W. R. C. Smith Publishing Co., Grant Bldg., Atlanta, Ga.

Too little consideration is given at time of purchase to the operating costs of plant auxiliaries, as governed by choice of drive. The convenience of the moment, and initial cost, have too often displaced operating costs, which persist day in and day out during the operating life of the equipment.

PUMPING PLANTS

"Supervisory System Controls Pump House." Electrical West, March 1, 1933, pp. 94-6. McGraw-Hill Publishing Co., 883 Mission Street, San Francisco, Cal.

Modern control, electrically heated pump house, thermostatic alarms, buried cable system and 3153 ft. lift are unusual features of Grand Canyon pumping plant of Santa Fe Railroad.

"Pumping Plant with 3153 Ft. Lift at Grand Canyon." Engineering News-Record, March 16, 1933, pp. 343-44. McGraw-Hill Publishing Co., 330 West Forty-second Street, New York City.

Santa Fe Railroad installs high-head plant of two 34-stage units handling 170 g.p.m. to eliminate hauling water supply 98 miles by tank car for hotels and railroad use.

PUMPS—CENTRIFUGAL

"Correction of Troubles in Centrifugal Pumps," John L. Stewart, Cleveland, Ohio. Power, March, 1933, pp. 124-5. McGraw-Hill Publishing Co., 330 West Forty-second Street, New York City.

Troubles with centrifugal pumps can be largely avoided if attention is given to suction and discharge piping design, and to the installation and operation of the equipment.

PURCHASED POWER

"Comparative Study of Steam and Electric Power," H. O. Fulson, Atlanta, Ga. The Cotton Oil Press, April, 1933, pp. 8-9. Interstate Publishing Co., Inc., Cotton Exchange Bldg., Memphis, Tenn.

Comparing of the average mill small steam plant with purchased electric current, most mill men sum up the situation with the statement that power cost is one of the smallest items in the cost of crushing cottonseed and many are content to let the matter stand as is. The fact remains that a survey of 42 of the very best mills in operation over a period of four years indicates that the average power cost per ton of seed amounted to $1.05 out of the $10.25 total cost of working per ton of seed.

If you have a completely electrified mill, figure your yearly cost for purchased power, using 95 KWH required to crush one ton of seed, based on a reduction of your crush of 20 per cent or 30 per cent reduction as the case may be. Then figure the cost of fuel, labor and maintenance for a steam plant on the basis of 1.34 hp. hours being equal to one KWH, 25 pounds of steam per hp. hour and 7 pounds of steam per pound of coal.

"Power for the U. S. Marine Hospital at Seattle," Charles H. Knowles, Mechanical Equipment Engineer, Seattle, Wash. Power Plant Engineering, April, 1933, pp. 160-3. Technical Publishing Co., Monadnock Block, 53 W. Jackson Blvd., Chicago, Ill.

Electric power and water are purchased from the City of Seattle and gas from the Seattle Gas Co. Electricity is purchased for approximately $0.01 per KWH, so that it was not considered necessary to install a generating plant.

REFRIGERATION

"Preserving Fruit and Vegetables by Freezing," Cold Storage and Produce Review, v. 36, No. 420, pp. 56-7 (discussion) 57-8; Empire House, St. Martins-le-Grand, London E C 1, England. See also Ice & Cold Storage, April, 1933, pp. 62-4 (discussion) 64.

Abstracts and discussions of two papers, by J. Barker and by T. N. Morris and R. E. Garnett, on future of preservation of fruits and vegetables by freezing, read before March meeting of British Association of Refrigeration.

"Preservation of Foods by New Quick-Freezing Methods," C. Birdseye, Refrigerating Engineering, April, 1933, pp. 185-8 and 201. American Society of Refrigerating Engineers, Publisher, 37 West Thirty-ninth Street, New York City.

Definition of quick-freezing; raw materials; pre-freezing treatment; packaging freezing; storage; transportation and marketing; quick-frozen foods in home; health values; costs of quick-frozen foods; research and future of quick-freezing. Before American Society of Refrigerating Engineers.

STATISTICAL DATA OF THE ELECTRIC LIGHT AND POWER INDUSTRY

Compiled Monthly by the Edison Electric Institute—Covers 100% of the Industry

DURING THE MONTH OF APRIL

	1933	1932	%
Kilowatt-hours Generated* (net)			
By fuel	3,111,627,000	3,388,537,000	− 8.2
By water power	2,881,170,000	2,863,757,000	+ 0.6
Total kilowatt-hours generated	5,992,797,000	6,252,294,000	− 4.2
Additions to Supply			
Energy purchased from other sources	154,221,000	179,182,000	−13.9
Net international imports	28,099,000	38,362,000	−26.8
Total	182,320,000	217,544,000	−16.3
Deductions from Supply			
Energy used in electric railway depts	55,517,000	73,152,000	−24.1
Energy used in electric and other depts	94,745,000	102,384,000	− 7.5
Total	150,262,000	175,536,000	−14.4
Total energy for distribution	**6,024,855,000**	**6,294,302,000**	**− 4.3**
Energy lost in transmission, distribution, etc	1,036,771,000	985,129,000	+ 5.2
Kilowatt-hours sold to ultimate consumers	**4,988,084,000**	**5,309,173,000**	**− 6.0**
Sales to Ultimate Consumers (Kw-hrs)			
Domestic service	979,905,000	997,674,000	− 1.8
Commercial—Small light and power (retail)	984,169,000	1,071,466,000	− 8.1
Commercial—Large light and power (wholesale)	2,422,684,000	2,605,394,000	− 7.0
Municipal street lighting	178,564,000	193,179,000	− 7.6
Railroads—Street and interurban	318,326,000	352,864,000	− 9.8
Railroads—Electrified steam	52,788,000	44,270,000	+19.2
Municipal and miscellaneous	51,648,000	44,326,000	+16.5
Total sales to ultimate consumers	4,988,084,000	5,309,173,000	− 6.0
Total revenue from Ultimate Consumers	$142,511,600	$153,363,600	− 7.1

DURING TWELVE MONTHS ENDING APRIL 30th

Kilowatt-hours Generated* (net)			
By fuel	44,122,286,000	54,006,678,000	−18.3
By water power	30,629,429,000	29,425,523,000	+ 4.1
Total kilowatt-hours generated	74,751,715,000	83,432,201,000	−10.4
Purchased energy (net)	2,628,846,000	2,815,053,000	− 6.6
Energy used in electric railway and other depts	1,986,966,000	2,281,370,000	−12.9
Total energy for distribution	**75,393,595,000**	**83,965,884,000**	**−10.2**
Energy lost in transmission, distribution, etc	13,662,090,000	14,030,716,000	− 2.6
Kilowatt-hours sold to ultimate consumers	**61,731,505,000**	**69,935,168,000**	**−11.7**
Total Revenue from Ultimate Consumers	$1,777,941,400	$1,941,587,000	− 8.4
Important Factors			
Percent of energy generated by waterpower	41.0%	35.3%	
Average pounds of coal per kilowatt-hour	1.47#	1.50#	
Domestic Service (residential use)			
Average annual consumption per customer (kw-hr)	596	590	+ 1.0
Average revenue per kw-hr (cents)	5.57¢	5.68¢	− 1.9
Average monthly bill per domestic customer	$2.77	$2.79	− 0.7

BASIC INFORMATION AS OF APRIL 30th

Generating Capacity (kw)—Steam	24,048,200	24,159,700	
—Water power	8,968,000	8,885,800	
—Internal combustion	457,400	450,900	
Total generating capacity in kilowatts	33,473,600	33,496,400	
Number of Customers			
Farms in Eastern Area (Included with Domestic)	(503,090)	(496,514)	
Farms in Western Area (Included with Com'l—Large)	(203,222)	(207,550)	
Domestic service	19,719,228	20,027,195	
Commercial—Small light and power	3,651,827	3,719,555	
Commercial—Large light and power	521,039	551,949	
All other ultimate consumers	71,321	63,976	
Total ultimate consumers	23,963,415	24,362,675	

* By courtesy of the U. S. Geological Survey with deductions for certain plants not considered Electric Light and Power Enterprises.

POWER PRODUCTION IN THE UNITED STATES

(100 per cent of the electric light and power industry)

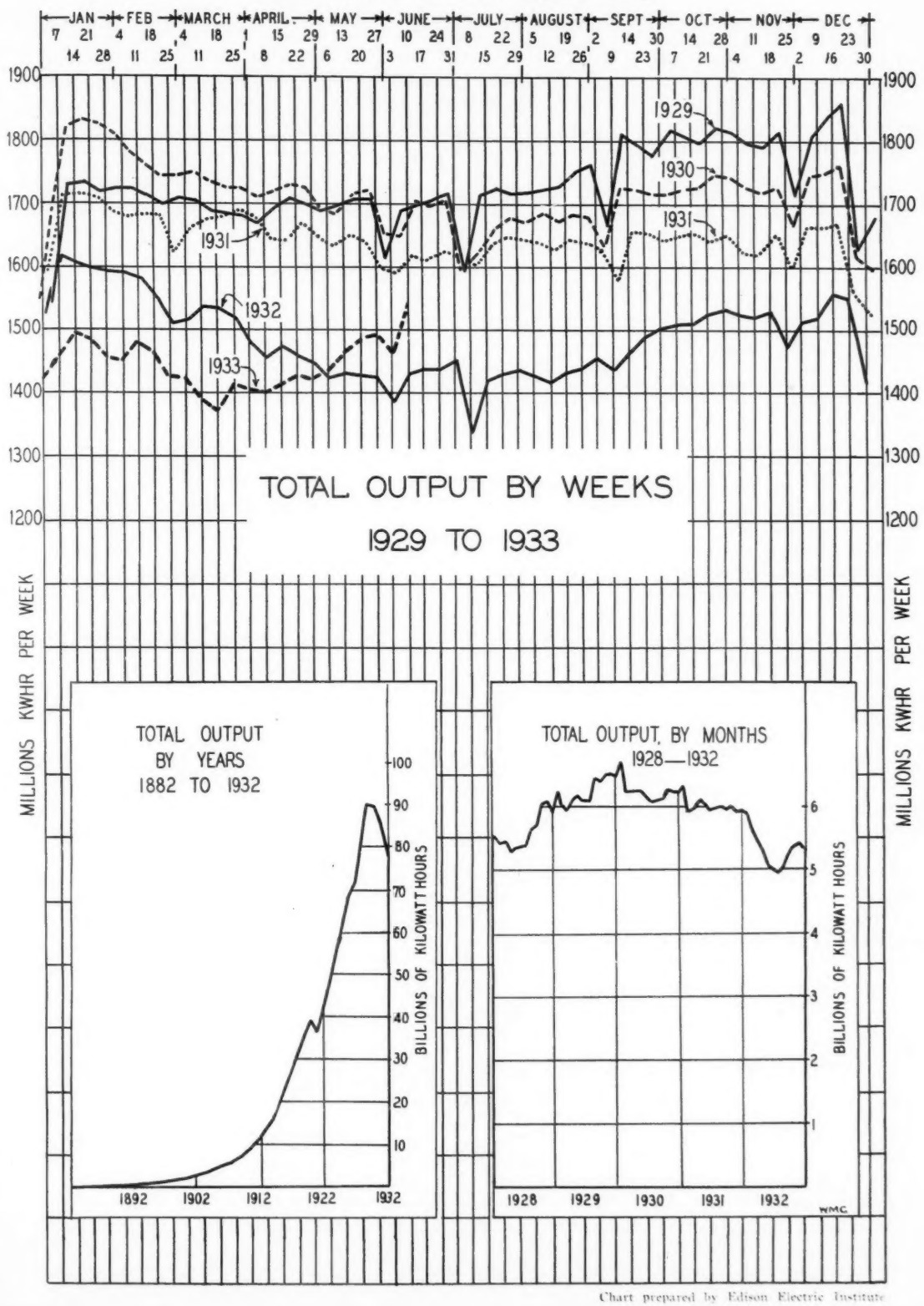


Chart prepared by Edison Electric Institute

ACCOUNTING COMMITTEE

(*Continued from page* 82)

diately contact the proper committee of the American Gas Association for the purpose of obtaining agreement on accounting principles in the Electrical and Gas Classifications.

2. That after agreement had been obtained we submit to the Committee on Statistics and Accounts of the National Association of Railway and Utilities Commissions a revised classification as the recommendation of the Accounting Committee of the Edison Electric Institute.

Mr. Fred W. Herbert was a guest of the Accounting Committee and gave some valuable assistance in the discussion of the Uniform Classification of Accounts for electric utilities.

STATISTICAL COMMITTEE

Mr. Wm. J. Hagenah, chairman of the Statistical Committee, called a luncheon meeting of the committee at the Palmer House, Chicago, on June 6, 1933. Seven of the eight members of the Statistical Committee were present at the meeting.

The Statistical Committee went over the manuscript and tables contained in Statistical Bulletin No. 9 and recommended that a publication containing essentially the same tables and charts as in Statistical Bulletin No. 8, published by the National Electric Light Association, be published by the Edison Electric Institute.

The development of a scope of activities of the Statistical Committee and other matters of business were deferred until the next meeting of the committee which will probably be called early this fall.

PUBLIC UTILITY RATE STRUCTURES

By L. R. Nash, Public Utility Consultant, McGraw-Hill Book Co., Inc., New York, N. Y. $4.00.

A very favorable review, written by Mr. Fred W. Herbert, of Mr. Nash's new book was scheduled for printing in this issue, but the editor regrets that space limitations prevented its publication this month. In the meantime he is glad to call it to the attention of readers of the BULLETIN.

CONTENTS OF THIS ISSUE

The Institute's First Convention 53
The President's Address ..... *By George B. Cortelyou* 55
Where Do We Go From Here? ..... *By Alex Dow* 59
Trend of Rates ..... *By F. A. Newton* 62
Taxation—Theory and Practice ..... *By W. C. Mullendore* 65
Evaluating Our National Coordinated Promotional Programs *By J. E. Davidson* 69
Amendments to the Constitution 71
The National Electric Cookery Program ..... *By P. S. Arkwright* 72
Commercialism and Competition—Today and Tomorrow, *By George E. Whitwell* 74
Some Phases of the Federal Trade Investigation ..... *By Bernard F. Weadock* 77
Committee Meetings at the Convention 81
Variable Elements in the Cost of Distribution of Electrical Energy, *By Norman H. Gibson* 83
Discussion of Mr. Gibson's paper, *By H. W. Fuller, D. K. Blake and H. B. Gear* 90
Winners of 1933 Prize Contests 93
Prize Awards to be Administered by the Institute 93
Prize Winners in Refrigeration Bureau Contest 94
Spring Meeting of the Joint Subcommittee on Development and Research 95
Power Sales Items 97
Statistical Data on the Electric Light and Power Industry 98

CONVENTIONS AND MEETINGS

JUNE

1 National Fire Protection Association, Hotel Schroeder, Milwaukee, Wis.
5-8 EDISON ELECTRIC INSTITUTE, Palmer House, Chicago, Ill.
4 Electrical Equipment Committee, Palmer House, Chicago, Ill., 10.00 a.m.
5 Power Generation Committee, Palmer House, Chicago, Ill., 2.00 p.m.
5 Transmission and Distribution Committee, Palmer House, Chicago, Ill., 2.00 p.m.
5 Sales Committee, 3.00 p.m., Palmer House, Chicago, Ill.
6 Operating Committee, 3.00 p.m., Palmer House, Chicago, Ill.
5-10 International Chamber of Commerce, Vienna, Austria.
8-10 National Electrical Wholesalers Association, Pacific Division, Del Monte, Cal.
12-15 National Association of Purchasing Agents, Boston, Mass.
14-16 Canadian Electrical Association, The Log Chateau, Lucerne-in-Quebec, Canada.
21-24 American Society of Agricultural Engineers, Lafayette, Ind.
25-30 American Institute of Electrical Engineers, Chicago, Ill.
26-30 American Society for Testing Materials, Chicago, Ill.
26-30 World Power Conference, Section Meeting, Stockholm, Sweden.
26-30 American Society of Civil Engineers, Chicago, Ill.

JULY

1 American Society of Civil Engineers, Chicago, Ill.
1-10 World Power Conference, Sectional Meeting, Stockholm, Sweden.

AUGUST

28-31 Illuminating Engineering Society, Delevan, Wis.

SEPTEMBER

4-8 American Institute of Electrical Engineers, Pacific Coast Meeting, Salt Lake City, Utah.
18-20 American Transit Association, The Stevens Hotel, Chicago, Ill.
25-29 American Gas Association, Chicago, Ill.

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